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NUCLEAR WEAPONS

NNSA Needs to Improve Guidance on Weapon Limitations and Planning for Its Stockpile Surveillance Program

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February 2012

NUCLEAR WEAPONS

NNSA Needs to Improve Guidance on Weapon Limitations and Planning for Its Stockpile Surveillance Program

GAO Highlights

Accountability * Integrity * Reliability

Highlights of GAO-12-188, a report to congressional requesters

Why GAO Did This Study

Most weapons in the U.S. nuclear stockpile were produced over 20 years ago and are being sustained beyond original design lifetimes. It is critical to ensure that these weapons are safe, secure, and reliable to perform as the nation's nuclear deterrent. The National Nuclear Security Administration (NNSA), a semiautonomous agency within the Department of Energy, is responsible for the nation's nuclear weapons program. NNSA identifies nuclear weapon limitations—areas where military requirements may not be met—and conducts nonnuclear tests to evaluate the condition and reliability of weapons through its nuclear stockpile surveillance program. GAO was asked to determine the (1) number and types of such limitations and any concerns raised by Department of Defense (DOD) officials, and (2) actions NNSA has taken to implement its prior recommendations for the nuclear stockpile surveillance program. GAO reviewed agency documents, analyzed limitations, and interviewed key NNSA and DOD officials.

What GAO Recommends

Among other things, GAO recommends that NNSA, in appropriate collaboration with DOD, expand guidance on weapon limitations to include all limitations, revise this guidance to clearly describe the limitations' potential impacts, and develop a corrective action plan for implementing surveillance program recommendations. NNSA generally agreed with GAO's recommendations and outlined planned actions to address them. DOD agreed with GAO's recommendations.

View GAO-12-188. For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov.

What GAO Found

For the 52 NNSA identified limitations for all weapons in the U.S. nuclear stockpile, 86 percent fall into six types: detonation safety under abnormal conditions, weapon reliability, weapon delivery, more frequent replacement of limited life components, nuclear yield, and worker safety. Some DOD officials expressed concern over the impact that certain weapon limitations have on weapon operation, maintenance, and war planning. According to DOD officials, current DOD mitigation actions, as well as the successful completion of ongoing and planned NNSA efforts, should address most limitations for which the officials raised concerns. DOD officials stated that the current stockpile allows sufficient flexibility to mitigate limitations. However, they told GAO that there may be less flexibility in the future as the stockpile continues to age and decreases in size. For each weapon system, NNSA provides DOD with guidance containing additional information on nuclear weapon limitations. However, GAO found that this guidance does not cover all limitations and some DOD officials said that it may not provide them with relevant information for some limitations. Specifically, the guidance addresses approximately 60 percent of all limitations but does not include limitations based on certain weapon components. In addition, one senior DOD official stated that the guidance did not help clarify the potential impact that a particular limitation may have on weapon operation and maintenance. The applicable military service is now conducting its own analysis of this limitation's potential impact. Furthermore, the national laboratories identified four existing weapon limitations (8 percent of all limitations) that are no longer valid because, among other reasons, corrective action to address the limitations is complete. In addition, it is uncertain if an ongoing DOD and NNSA review of nuclear weapon military requirements will be used to eliminate limitations based on potentially outdated military requirements.

NNSA has begun to implement some recommendations from the agency's draft October 2010 management review of the nuclear stockpile surveillance program but has not developed a corrective action plan to guide its multiple actions. For example, NNSA (1) created and staffed the position of Senior Technical Advisor for Surveillance in response to the review's recommendation to establish strong NNSA leadership and (2) established a formal process for setting surveillance testing requirements. National laboratory and DOD officials GAO interviewed generally viewed NNSA's actions as positive steps to improve the program. However, NNSA has not developed a corrective action plan, as called for by Office of Management and Budget Circular No. A-123. According to this circular on management controls, federal managers are to develop a corrective action plan to address program operations weaknesses identified through management reviews, among other things. Such plans are to include specific dates, assigned responsibilities, and metrics to measure progress and hold management accountable. According to a senior level NNSA official, the agency did not implement many of the recommendations from three prior surveillance program management reviews primarily because there was no specific approach for implementation. Without a corrective action plan, it is unclear how NNSA will (1) ensure that the draft October 2010 management review's recommendations are fully implemented and (2) demonstrate to key stakeholders, such as Congress and DOD, that NNSA is committed to improving the surveillance program.

Contents

Abbreviations

CT	computed tomography
DOD	Department of Defense
DOE	Department of Energy
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
MAR	major assembly release
NNSA	National Nuclear Security Administration
OMB	Office of Management and Budget
RMI	Requirements Management Integration
SNL	Sandia National Laboratories
STRATCOM	U.S. Strategic Command

GAO
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Congressional Requesters

Arms control agreements and other policies since the 1960s have led the United States to maintain nuclear deterrence with decreasing numbers of weapons. Most nuclear weapons currently in the stockpile were produced over 20 years ago and are being sustained beyond their original design lifetimes. Consequently, it is critical to ensure that the weapons in the nuclear stockpile are safe, secure, and reliable.

The National Nuclear Security Administration (NNSA), a semiautonomous agency within the Department of Energy (DOE), is responsible for, among other things, the nation's nuclear weapons, nonproliferation, and naval reactors programs.[1] NNSA manages the nuclear stockpile through the three national nuclear weapons design laboratories—Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratories (SNL); four production plants—Pantex Plant in Texas, Y-12 National Security Complex in Tennessee, Savannah River Site in South Carolina, and Kansas City Plant in Missouri; and the Nevada National Security Site.

The U.S. Strategic Command (STRATCOM), part of the Department of Defense (DOD), has primary responsibility for targeting nuclear weapons, preparing the U.S. strategic nuclear war plan, and, if ordered by the President, executing the war plan. The Nuclear Weapons Council, established by Congress in 1986, is a joint DOD/DOE organization that facilitates high-level coordination to secure, maintain, and sustain the nuclear stockpile.[2] The Nuclear Weapons Council charters a Project Officers Group for each weapon system to provide a technical forum for weapon development and management activities.[3] Each Project Officers Group is led by a lead project officer from either the Navy or Air Force; both the Navy and Air Force (referred to in this report as military service) maintain and operate nuclear weapons.

[1]NNSA was created in 1999 under Title 32 of the National Defense Authorization Act for Fiscal Year 2000, Pub. L. No. 106-65, § 3201 *et seq*.

[2]Pub. L. No. 99-661, § 3137 (1986).

[3]In this report, we use the term weapon to refer to a weapon system.

Weapons are designed and produced to meet DOD's military requirements—key operational, nuclear yield, and maintenance requirements—throughout the Stockpile-to-Target Sequence, which is the range of physical environments that could be encountered as the weapon travels from stockpile storage to a potential target.[4] The responsible national laboratories prepare a major assembly release (MAR) when they determine that a nuclear weapon is satisfactory for release to the military service. Among other things, the MAR contains a list of the weapon's limitations, which are areas where the weapon may not meet certain military requirements throughout the Stockpile-to-Target Sequence. Limitations may specify additional conditions for storing, maintaining, or operating the weapon.

According to NNSA and DOD officials, identifying limitations is important to stockpile management because it provides a mechanism for explicitly knowing where DOD requirements may not be met and suggests strategies to mitigate risk. Some limitations are unique to a particular weapon, and other limitations may occur in multiple weapons. NNSA periodically updates a weapon's MAR for a variety of reasons, including a completion of a weapon alteration or a life extension program (referred to in this report as activities). A weapon alteration is a material change regarding assembly, maintenance, or storage that does not alter the weapon's operational capability. A life extension program, which can take up to a decade to complete, is a refurbishment intended to extend the lifetime of a weapon for an additional 20 to 30 years. When NNSA updates a weapon's MAR, existing limitations may either remain unchanged or be deleted, and new limitations may be added.

Since 1992, the United States has observed a moratorium on underground testing of nuclear weapons. In 1995, the President established an annual stockpile assessment and reporting requirement to help ensure that the nation's nuclear weapons remain safe and reliable without underground nuclear testing. Subsequently, Congress enacted the National Defense Authorization Act for Fiscal Year 2003, which requires that the directors of the national laboratories and the Commander of STRATCOM each complete an annual nuclear weapons stockpile assessment report.[5] These reports cover, among other things,

[4]For example, a Stockpile-to-Target Sequence may include a temperature range of -180 to +155 degrees Fahrenheit and an acceleration force of 10G at launch.

[5]Pub. L. No. 107-314, § 3141 (2002).

issues of particular concern about the nuclear stockpile as a whole, as well as issues of concern for individual weapons.[6]

Shortly after the moratorium on underground testing, Congress required DOE to establish the Stockpile Stewardship Program to increase understanding of the basic phenomena associated with nuclear weapons and provide better predictive understanding of the safety and reliability of weapons, among other things.[7] One element of the Stockpile Stewardship Program is NNSA's Stockpile Evaluation Program (surveillance program).[8] Under this program, NNSA conducts a variety of nonnuclear tests that evaluate the condition, safety, and reliability of stockpiled weapons. NNSA's surveillance program is a critical information source for overall knowledge of the stockpile, as well as the annual assessment process. In the last five annual assessment reports (fiscal years 2006 through 2010), directors of the national laboratories consistently expressed concerns with the surveillance program, both about the overall direction of the program and the limited number of surveillance tests being conducted. The STRATCOM Commander reported similar concerns in his 2009 and 2010 annual assessment reports. Furthermore, in 2009, the JASON panel of scientific experts recommended that NNSA revise the surveillance program to meet immediate and future stockpile needs.[9] In its report accompanying the Fiscal Year 2011 National Defense Authorization Act, the House Armed Services Committee (1) stated that surveillance is essential to stockpile stewardship and that inadequate surveillance would place the stockpile at risk and (2) directed NNSA to submit a report by October 1, 2010, to the congressional

[6]The Secretaries of Energy and of Defense are required to submit the laboratory directors' and STRATCOM Commander's annual assessment reports unaltered to the President, who forwards them to Congress, along with the conclusions the Secretaries have reached about the safety, reliability, performance, and military effectiveness of the nuclear stockpile.

[7]Pub. L. No. 103-160, § 3138 (1993).

[8]According to NNSA officials, the surveillance program started in 1958.

[9]JASON is a group of nationally known scientists who advise government agencies on defense, energy, and other technical issues.

defense committees on its plans to address the 2009 JASON recommendation.[10]

Recognizing the need for a revised surveillance program in the post Cold War era, NNSA has conducted management reviews of the surveillance program in 2001, 2004, 2007, and 2010. The latest management review, issued in draft in October 2010 and not yet made final, found that NNSA did not implement the majority of prior recommendations to revise the program because NNSA (1) does not have a well-defined, documented process for executing the surveillance program; (2) changed leadership of the surveillance program at critical points in the implementation of early recommendations; and (3) did not develop a metric to ensure full implementation of any recommendation, which resulted in a continuing emphasis on reassessing the program. The draft 2010 review observed that many prior recommendations were still applicable today and provided additional recommendations, such as establishing strong federal leadership, implementing formal processes to guide program planning and execution, and establishing communication and information pathways.

In this context, you asked us to review nuclear weapon limitations and the state of the surveillance program. Specifically, we examined the (1) number and types of identified weapon limitations and any concerns raised by DOD officials (Navy, Air Force, and STRATCOM); and (2) actions NNSA has taken to implement its prior recommendations for the nuclear stockpile surveillance program.

Scope and Methodology

To determine the number and type of nuclear weapon limitations, we reviewed each weapon's current MAR and associated NNSA guidance. We then interviewed officials from NNSA and the national laboratories to obtain clarification on technically complicated limitations. NNSA and DOD do not group limitations into types or categories. However, in order to report unclassified weapon limitation information in this report, we developed categories for types of limitations based on the MAR information. Using content analysis methodology, two analysts independently assessed each

[10]H.R. Rep. No. 111-491 (May 21, 2010). NNSA officials told us that the agency addressed this reporting requirement on April 15, 2011, by including a classified annex in its Fiscal Year 2012 Stockpile Stewardship and Management Plan.

limitation and coded it as a certain type of limitation.[11] To determine DOD officials' concerns with the limitations' impact for nuclear weapon operations, maintenance, and war planning, we interviewed officials in the Office of the Deputy Assistant Secretary of Defense for Nuclear Matters, Navy and Air Force lead project officers from each weapon's Project Officer Group and interviewed and received briefings from officials in STRATCOM's Joint Functional Component Command For Global Strike, the entity responsible for preparing and maintaining the nation's nuclear war plan. In addition, we reviewed and analyzed the last five annual assessment reports (fiscal years 2006 to 2010) to determine what limitations the STRATCOM Commander reported. We also interviewed the current chairman of a technical advisory group who is responsible for completing the majority of the STRATCOM Commander's annual assessment report and reviewed prior GAO work on the annual assessment process.[12] To determine what, if any, mitigation actions DOD and NNSA currently engage in or plan to complete to address nuclear weapon limitations, we reviewed NNSA guidance and interviewed NNSA, national laboratory, and DOD officials. To determine how NNSA manages and reports on nuclear weapon limitations, we reviewed (1) established procedures governing the MAR development and revision process, (2) NNSA guidance on nuclear weapon limitations, and (3) documents associated with an ongoing joint DOD/NNSA review of nuclear weapon military requirements. We compared the documents with the *Standards for Internal Control in the Federal Government*.[13] To determine if certain nuclear weapon limitations were potentially no longer applicable, we compared limitations with the most current information related to corrective actions as well as the current applicability of military requirements, as reported by NNSA guidance on limitations and officials from NNSA, the national laboratories, and DOD.

To determine the extent to which NNSA has taken actions to address its recommendations on its surveillance program, we reviewed NNSA's draft

[11]Intercoder reliability (agreement) statistics were generated in the coding process, and the two analysts agreed on 90 percent of the limitations. Coding differences were resolved through reviewer discussion.

[12]GAO, *Nuclear Weapons: Annual Assessment of the Safety, Performance, and Reliability of the Nation's Stockpile,* GAO-07-243R (Washington D.C.: Feb. 2, 2007).

[13]GAO, *Standards for Internal Control in the Federal Government*, GAO/AIMD-00-21.3.1 (Washington, D.C.: November 1999).

October 2010 management review and analyzed key NNSA documentation related to implementation efforts. This documentation includes a draft version of NNSA's surveillance program manual; charters establishing the roles and responsibilities for entities responsible for managing the program; draft project management tools; and newly established procedures for establishing, executing, and tracking surveillance testing requirements. In addition, we interviewed key NNSA personnel, including the acting senior technical advisor for surveillance, about NNSA's planned efforts to address its recommendations. We also compared NNSA's actions against the federal standards for addressing recommendations from management reviews contained in the *Standards for Internal Control in the Federal Government* and Office of Management and Budget (OMB) Circular No. A-123, *Management's Responsibility for Internal Control*.[14] To determine the national laboratories' role in the surveillance program, we conducted site visits, toured select facilities used to conduct surveillance tests, interviewed officials, and received briefings from officials at LLNL and SNL.[15] We requested and received information in writing from LANL.

We conducted our work from October 2010 to February 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

NNSA's Office of Defense Programs is responsible for the manufacture, maintenance, refurbishment, surveillance, and dismantlement of nuclear weapons. Most modern nuclear weapons consist of three sets of components—a primary, a secondary, and a set of nonnuclear components enclosed in a case. When detonated, the primary and secondary components, which together are referred to as the weapon's "nuclear explosive package," produce the weapon's explosive force, or "yield." LANL, located in Los Alamos, New Mexico, and LLNL, located in

[14]GAO/AIMD-00-21.3.1.

[15]For our site visits, we selected one of the two national laboratories with design responsibility for a weapon's nuclear components and the national laboratory with design responsibility for nonnuclear components.

Livermore, California, have design responsibility for the nuclear explosive package. SNL, located in Albuquerque, New Mexico, and Livermore, California, has design responsibility for nonnuclear components. Some nonnuclear components—collectively called "limited-life components"—have shorter service lives than the weapon itself and, therefore, must be periodically replaced. The U.S. nuclear weapons stockpile consists of eight weapons systems. Table 1 shows the weapon systems in the U.S. nuclear stockpile, their dates of entry into the stockpile, and the laboratories and military services responsible for each system.

Table 1: Nuclear Weapons in the U.S. Stockpile, as of September 2011

Warhead or bomb	Description	Military service	Laboratory	Date of entry into stockpile
B61-3/4/10	Tactical bomb	Air Force	LANL, SNL	1979/1979/1990
B61-7/11	Strategic bomb	Air Force	LANL, SNL	1985/1996
W76-0/1	SLBM warhead[a]	Navy	LANL, SNL	1978/2008
W78	ICBM warhead[b]	Air Force	LANL, SNL	1979
W80-0/1[c]	Cruise missile warhead	Navy/Air Force	LLNL, SNL	1984/1982
B83-1	Strategic bomb	Air Force	LLNL, SNL	1993
W87	ICBM warhead	Air Force	LLNL, SNL	1986
W88	SLBM warhead	Navy	LANL, SNL	1989

Source: NNSA.

[a]Submarine-launched ballistic missile.

[b]Intercontinental ballistic missile.

[c]The Department of Defense concluded in 2010 that the Navy's W80-0 serves a redundant purpose and should be retired.

In February 2007, we reported on the process that DOD and DOE have established for fulfilling the annual assessment of the safety, performance, and reliability of the nation's nuclear stockpile.[16] We found that (1) the STRATCOM Commander's annual assessment of the nuclear stockpile is based primarily on the advice of a technical advisory group and provides an operational perspective; (2) the technical advisory group holds an annual conference where each entity involved in managing the stockpile—national laboratories, Project Officer Groups, NNSA, and DOD—present briefings to provide a complete perspective on the various issues affecting the stockpile; and (3) the laboratory director's annual assessment is derived primarily from ongoing activities associated with NNSA's Stockpile Stewardship Program, such as the results of weapon system and component level tests conducted

[16]GAO-07-243R.

by NNSA's stockpile surveillance program as well as data that provides an assessment of a weapon's current reliability.

NNSA's stockpile surveillance program comprises the Core Surveillance Program and the Enhanced Surveillance Campaign, which are funded separately. Under the Core Surveillance Program, the national laboratories and production plants evaluate weapons and weapon components for the attributes of function, condition, material properties, and chemical composition through the following:

- *System-Level Laboratory Testing*. For such tests, units from each stockpiled weapon are chosen annually, either randomly or specifically, and sent to the Pantex Plant for disassembly, inspection, reconfiguration, and testing by the national laboratories.

- *System-Level Flight Testing*. These tests drop or launch a weapon with its nuclear material removed. NNSA coordinates flight testing with DOD, which is responsible for providing the military assets (e.g., aircraft and missiles) needed to drop or launch a weapon.

- *Component and Material Testing*. These tests are conducted on nuclear and nonnuclear components and materials by both the national laboratories and the production plants that manufactured them.[17]

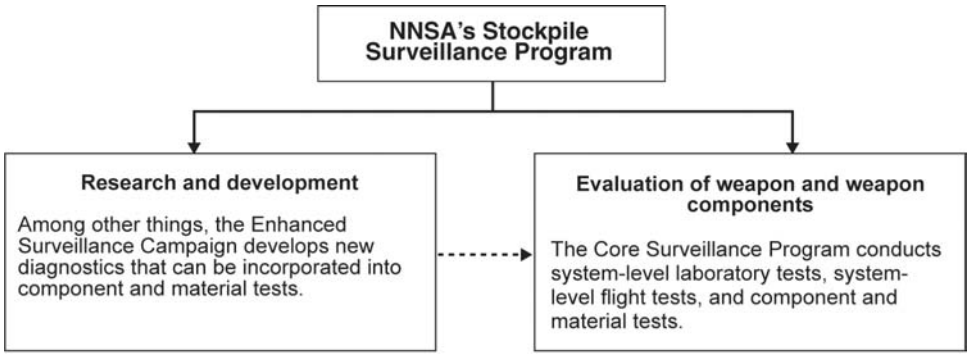
The mission of the Enhanced Surveillance Campaign—a research and development effort initiated in 1998—is to provide tools for assessing weapon aging by characterizing aging trends, develop predictive aging models, and develop new diagnostic capabilities.[18] When the diagnostics developed by the Enhanced Surveillance Campaign reach maturity, they can be incorporated into the Core Surveillance Program's component and material tests. For example, in fiscal year 2009, the Enhanced Surveillance Campaign developed a high-resolution computed

[17]In 2007, NNSA embarked on a series of fundamental changes to the surveillance program that it believes will improve the detection of aging defects through increased testing of weapon components and materials. NNSA initially expected to complete component and material testing pilots by 2012 but now expects completion of these testing pilots by 2018.

[18]NNSA defines campaigns as technically challenging, multiyear, multifunctional efforts to develop and maintain the critical capabilities needed to continue assessing the safety and reliability of the nuclear stockpile without underground testing.

tomography (CT) image analysis tool for a particular nuclear component, which NNSA officials said they believe will enhance its ability to identify potential defects or anomalies. NNSA plans to conduct approximately 30 of these CT component tests in fiscal year 2012 under Core Surveillance, according to planning documents. Figure 1 shows the interrelationships among the segments of NNSA's Stockpile Surveillance Program.

Figure 1: NNSA's Stockpile Surveillance Program



Source: GAO analysis of NNSA data.

Action Being Taken to Address Limitations of U.S. Nuclear Weapons

For all U.S. nuclear weapons in the current nuclear stockpile, NNSA identified 52 weapon limitations, and of these, the majority fall into six types. DOD officials told us that a few limitations are a concern due to the potential impact on DOD weapon operation, maintenance, and war planning, but these officials also said that current and planned mitigation actions generally address their concerns with weapon limitations. We found that NNSA guidance to DOD on some limitations contains incomplete information, and DOD officials told us that the way NNSA communicates the potential impact of limitations on nuclear weapon operation, maintenance, and war planning is sometimes unclear. Furthermore, the national laboratories identified four existing weapon limitations (8 percent of all limitations) that are no longer valid—because, among other things, corrective action to address the limitation is complete—while some limitations will remain in effect until DOD changes potentially outdated military requirements.

Types of Limitations, DOD Concerns, and Mitigation Actions

We characterized the 52 limitations that NNSA identified for all U.S. nuclear weapons into 10 types of limitations based on our analysis of each weapon's MAR and associated guidance documents as well as through interviews with officials from NNSA, the national laboratories, and DOD. Eighty-six percent of these limitations fall into 6 types: detonation safety under abnormal conditions, weapon reliability, weapon delivery, more frequent replacement of limited life components, nuclear yield, and worker safety. According to DOD officials, a large majority of these weapon limitations do not impact DOD nuclear weapon operation, maintenance, and war planning activities. However, some DOD officials expressed concerns to us over the impact of a few weapon limitations, such as increased maintenance costs or additional issues to consider when developing war plans. For most limitations about which they raised concerns, DOD officials told us that current DOD mitigation actions, as well as the successful completion of ongoing and planned NNSA efforts, should address these concerns. DOD officials stated that the current stockpile allows sufficient flexibility to mitigate limitations. However, they told us there may be less flexibility in the future as the stockpile continues to age and decreases in size. Moreover, officials at one national laboratory told us that a smaller stockpile may not be able to support required mitigation actions if additional limitations, especially those that result in large decreases to weapon reliability, are identified in the future. The 2010 Nuclear Posture Review states that the United States is currently considering future stockpile reductions that would be based on a variety of factors, including the continuing implementation of NNSA's Stockpile Stewardship Program.[19] Table 2 and the following discussion relates to the type of nuclear weapon limitations and the percentage of those limitations by type.

[19]The Nuclear Posture Review is a legislatively mandated review that establishes U.S. nuclear policy, strategy, capabilities and force posture for the next 5 to 10 years.

Table 2: Types of Nuclear Weapon Limitations for all U.S. Nuclear Weapons

Type of nuclear weapon limitations	Percentage of the 52 limitations for all U.S. nuclear weapons
Detonation safety under abnormal conditions	25%
Weapon reliability	13%
Weapon delivery	12%
More frequent replacement of limited life components	12%
Nuclear yield	12%
Worker safety	12%
Weight	6%
Transportation	4%
Weapon testing unable to duplicate an Stockpile-to-Target Sequence environment	4%
Reliability of use control system component[a]	2%

Source: GAO analysis of NNSA's MAR documents.

Notes: Percentage does not equal 100 due to rounding.

[a]A use control system is a combination of design features, operational procedures, and other controls intended to allow authorized use and prevent unauthorized use of nuclear weapons.

- *Detonation safety under abnormal conditions*. Thirteen limitations—25 percent of all nuclear weapon limitations—are associated with detonation safety under abnormal conditions (i.e., conditions not expected to occur during nuclear explosive operations and associated activities). DOD officials did not raise concerns with any limitations of this type. As established by DOD, the probability of a nuclear detonation must not exceed 1 in a million per exposure to abnormal conditions (i.e., detonation safety standard for abnormal conditions). NNSA has issued a safety limitation for each weapon concerning potential exposure to a certain combination of abnormal conditions. DOD officials told us that these safety limitations are not a concern, provided that established procedures are followed, because of the extremely low probability of a weapon's exposure to the abnormal conditions.[20] Specifically, both the Air Force and Navy have established procedures and restrictions for storing, handling, and transporting a nuclear weapon to minimize, among other things, the

[20]A 1998 joint DOE-DOD study determined that the probability of encountering the abnormal conditions to be extremely unlikely and did not recommend any operational changes.

potential that weapons are exposed to any abnormal conditions. In addition, there is another limitation, common across multiple weapons, concerning a weapon's high explosives being exposed to abnormal conditions. DOD officials told us that this limitation is not a concern and that there is a very low probability that a weapon would encounter the abnormal conditions. Furthermore, they said that there is infinite combination of possibilities for the specified abnormal conditions. As such, it is very difficult for NNSA to produce computational models that can verify DOD's detonation safety standard is met for each possibility.[21]

- *Weapon reliability*. Seven limitations—13 percent of all nuclear weapon limitations—are associated with weapon reliability.[22] DOD officials did not raise concerns with five weapon limitations of this type but did raise concerns with two specific weapon reliability limitations. DOD officials told us that one limitation could potentially impact DOD operations; however, no mitigation actions have been developed because the applicable military service and the national laboratories are still trying to understand the technical issues behind the limitation. DOD officials told us that another limitation, associated with a particular weapon system, could potentially impact war planning or operations, and the STRATCOM Commander stated in two recent annual assessments reports that he had concerns with this particular reliability limitation.[23] DOD officials told us that both short-term and long-term mitigation actions address this limitation. Specifically, STRATCOM revised its planning to include actions that can increase the reliability of a key weapon component and thus increase the weapon's overall reliability. However, STRATCOM officials told us that these mitigation actions impact operational flexibility. According to these officials, NNSA's planned activities for this weapon, when completed, will address the reliability limitation, among other things. In

[21]Officials at one national laboratory told us that these abnormal conditions are an extraordinary unlikely event that cannot be assessed with existing stockpile stewardship tools and that no mitigation activities are planned for these types of events.

[22]NNSA defines weapon reliability as "the probability of achieving the specified yield, at the target, across the Stockpile-to-Target Sequence of environments, throughout the weapon's lifetime, assuming proper inputs."

[23]According to the Chairman of the technical advisory group, weapon limitations generally do not affect STRATCOM's war planning efforts but that, on occasion, the STRATCOM Commander determined that certain limitations could affect some aspects of war planning.

the most recent annual assessment, the Commander wrote that NNSA's planned activities to address this limitation, among other things, faces schedule constraints and will likely require additional resources.

- *Weapon delivery*. Six limitations—12 percent of all nuclear weapon limitations—relate to the delivery of a weapon to its intended target. DOD officials did not raise concerns with four weapon limitations of this type, and they told us that mitigation actions have addressed their concerns with potential impacts to DOD operation, maintenance, and war planning activities for two specific weapon delivery limitations. Specifically, one limitation states that a weapon may not perform as designed if delivered in a particular mode. STRATCOM officials told us that they no longer plan to deliver the weapon in that mode but would instead use an alternate delivery mode that can produce similar weapon effects. The second limitation states that a weapon no longer met what DOD officials described to us as a key weapon delivery requirement. STRATCOM officials told us that joint actions between the applicable military service and STRATCOM mitigate their concerns with this limitation, though at higher weapons maintenance and management costs.

- *More frequent replacement of limited life components*. Six limitations—12 percent of all nuclear weapon limitations—are associated with the more frequent replacement of components that have a shorter service life than the weapon itself. DOD officials did not raise concerns with two weapon limitations of this type but did raise concerns with four specific limited life components replacement limitations. According to DOD officials, these four limitations significantly increase the military's maintenance burdens or costs for the affected weapons. For example, a military service lead project officer told us that each replacement activity imposes a substantial cost—in labor, equipment operation, and security risks—and that more-frequent replacement activities further increase these already substantial costs. This lead project officer said that, within the next few years, NNSA plans activities that, when complete, will meet the replacement interval established by DOD. Furthermore, another military service lead project officer told us that more-frequent replacement complicates the coordination of maintenance schedules and stated that NNSA has not planned any actions to address this limitation because of expected changes to the nuclear force structure.

- *Nuclear yield.* Six limitations—12 percent of all nuclear weapon limitations—concern a weapon's capability to produce the desired

nuclear yield. DOD officials did not raise concerns with five weapon limitations for this type, and they told us that mitigation actions have addressed their concerns with potential impacts to war planning for one specific nuclear yield limitation. DOD officials said that most of the nuclear yield limitations reflect negligible differences from the yield requirements specified by DOD and do not affect war planning because of improved accuracy in delivering weapons to potential targets. However, DOD officials told us that one of these limitations, associated with a single weapon system, could affect DOD war planning but that the impact is mitigated in the short term by having the military service conduct more-frequent maintenance on the weapon. NNSA is also planning activities that, if successful, would address the limitation.

- *Worker safety*. Six limitations—12 percent of all nuclear weapon limitations—concern workers' personal safety when conducting weapon operation and maintenance activities. DOD officials did not raise concerns with any limitations of this type. Specifically, these officials said that some of these limitations would be encountered if a low-probability event with multiple abnormal conditions occurred together and that some of these limitations have been addressed by established procedures for maintenance activities. For example, maintenance technicians working on a certain weapon are to follow procedures designed to limit the amount of energy present in the maintenance bay.

- *Weight*. Three limitations—6 percent of all nuclear weapon limitations—concern a weapon's actual weight being greater than the weight specified by DOD. DOD officials did not raise concerns with any limitations of this type. These limitations are applicable to three weapon systems. DOD officials said that these limitations were present when the weapons were first produced.

- *Transportation*. Two limitations—4 percent of all nuclear weapon limitations—relate to how a weapon can be transported. DOD officials did not raise concerns with any limitations of this type and said that NNSA has already addressed one of these limitations. Specifically, NNSA has developed a specialized transportation adaptor that enables transportation of the weapon in a manner consistent with DOD military requirements.

- *Weapon testing unable to duplicate a Stockpile-to-Target Sequence environment.* Two limitations—4 percent of all nuclear weapon limitations—are associated with the inability of a single weapon

system's testing program to duplicate two environments that the weapon could encounter as it travels from the stockpile to a possible target. DOD officials did not raise concerns with these two specific limitations and said that NNSA now believes that the agency can duplicate one of the specified environments. NNSA plans to conduct a computational simulation and analysis of this specified environment during fiscal year 2012.

- *Reliability of use control system components*. One limitation—2 percent of all nuclear weapon limitations—is associated with the reliability of use control system components. DOD officials did not raise any concerns with this type of limitation because of changes in operational plans.

NNSA Guidance to DOD on the Potential Impact of Weapon Limitations Is Not Complete and Consistently Clear

Through Sandia National Laboratories, NNSA provides DOD guidance containing additional information on nuclear weapon limitations for each weapon. However, we found that this guidance does not cover all current limitations, and DOD officials said that it may not provide them with relevant information for some limitations. DOD officials told us that nuclear weapon limitations—which are primarily reported to DOD when NNSA issues or revises a weapon's MAR—can be statements that, in some instances, contain highly technical information and vague wording and may not clearly communicate a limitation's potential impact on stockpile operation, maintenance, and war planning. As stated previously, most modern nuclear weapons consist of the nuclear explosive package and nonnuclear components enclosed in a case. In general, limitations arise due to issues associated with either a weapon's nuclear components or nonnuclear components. For limitations that involve components for which Sandia National Laboratories has design responsibility (i.e., nonnuclear components), the guidance lists each limitation as written in the MAR; usually provides additional technical information about the limitation's cause, scope and impact; and lists a recommended mitigation action.[24] The guidance includes information on 29 limitations—about three-fifths of all current limitations. However, the guidance does not provide information for limitations that are associated with a weapon's nuclear explosive package. The guidance states that

[24]Sandia National Laboratories began issuing the guidance in 2009. This document also provides guidance on "environments of concerns," which are areas where military requirements are still met but with decreased safety or performance margins.

these limitations are for the two national laboratories with design responsibility for nuclear components to address, but neither NNSA nor its two laboratories (Los Alamos National Laboratory and Lawrence Livermore National Laboratory) provide DOD with such guidance on nuclear weapon limitations.

GAO's *Standards for Internal Control in the Federal Government* states that management should comprehensively identify risks from both external and internal sources and that once risks have been identified, management should decide what actions should be taken to manage them.[25] As stated previously, nuclear weapon limitations identify areas where DOD's military requirements may not be met. Potentially unmet DOD military requirements could present risks to nuclear weapon operation, maintenance, and war planning and require mitigation actions. It is critical that NNSA's guidance to DOD on nuclear weapon limitations identify all existing limitations to help ensure that risks are comprehensively identified and management has the information needed to determine what, if any, actions are needed to manage weapon limitations.

In addition, NNSA's guidance on nuclear weapon limitations may not always provide DOD with sufficiently relevant information about the potential impact some nuclear weapon limitations may have on stockpile operation, maintenance, and war planning. For example, one military service lead project officer said that his efforts to clarify the impact that a particular limitation may have on weapon reliability with officials at a national laboratory were inconclusive and that the military service is now conducting its own analysis. For this particular limitation, NNSA's guidance provides little additional technical information and concludes that the weapon may not operate as required in a particular delivery mode, and the recommended mitigation action is to have laboratory staff brief STRATCOM war planners. Acknowledging that the guidance is relatively new, the military service lead project officer told us that the document is not very helpful in explaining this limitation's potential operational impact and that discussing a limitation in terms of military requirements and Stockpile-to-Target Sequence would be more helpful. GAO's *Standards for Internal Control in the Federal Government* states that information should be recorded and communicated to management

[25]GAO/AIMD-00-21.3.1.

and others within an entity in a form and within a time frame that enables them to carry out their responsibilities.[26] Since military service lead project officers are senior managers responsible for a weapon's development and management activities, it is critical that NNSA's guidance provides information in a form that allows them to fully understand the potential impacts limitations have on nuclear weapon operations, maintenance, and war planning to determine what, if any, actions are needed to manage weapon limitations.

The National Laboratories Identified Some Limitations That Are No Longer Valid, While Other Limitations Will Remain Valid until DOD Changes Military Requirements

The national laboratories identified 4 (8 percent) of the 52 current nuclear weapon limitations—affecting four weapons—as no longer valid and should be removed when NNSA revises the weapons' MAR.[27] The national laboratories concluded that these 4 weapon limitations could be removed from the list of limitations contained in a weapon's MAR for various reasons, including that corrective action to address the limitation has been completed, that there is no military requirement, and that the replacement interval for limited life components currently meets and has always met military requirements. DOD and NNSA officials told us that if NNSA cannot prove that a weapon meets military requirements, a limitation must be listed for that weapon. Our review found and some DOD officials we spoke with said that certain military requirements for nuclear weapons that were applicable during the Cold War may not be applicable given the structure and role of today's nuclear stockpile. In addition, some DOD officials we spoke with said that the department can be reluctant to modify a weapon's established military requirements because there is little documentation or transparency about why some military requirements exist and that this issue is especially applicable to weapons that were designed to be delivered from multiple military assets. These officials said that DOD does not want to delete a requirement unless there is sufficient evidence for why it was established and it is clear that the basis for that requirement is no longer applicable.

DOD and NNSA are currently jointly reviewing and considering changing DOD's nuclear weapon requirements to help align NNSA infrastructure planning with deterrent planning, according to documentation from the

[26]GAO/AIMD-00-21.3.1.

[27]We included these four limitations in our above analysis of the types of weapon limitations because they are listed in each weapon's current MAR.

Nuclear Weapons Council. The findings of this joint review could also be used to ensure that limitations reflect the most current and accurate information. For example, one weapon delivery limitation that DOD officials did not raise concerns with could be eliminated if military requirements are updated because there is sufficient specificity as to the origin of that requirement to conclude that it is no longer applicable to today's current and planned nuclear force structure, according to STRATCOM officials. However, the joint DOD and NNSA requirements review does not have a specific completion date, and it is uncertain if the review's findings will be used to update limitations based on potentially outdated military requirements and, thereby, ensure a relevant and reliable counting of nuclear weapon limitations.

NNSA Has Not Developed a Corrective Action Plan to Improve the Nuclear Stockpile Surveillance Program

NNSA has begun to implement some of the recommendations from its draft October 2010 management review of the nuclear stockpile surveillance program, but NNSA has not developed a formal corrective action plan to guide its multiple actions. The draft October 2010 review, conducted jointly by NNSA and the three national laboratories, makes multiple recommendations to NNSA to address a number of weaknesses in the surveillance program, such as the lack of federal leadership in program management and the absence of formal, documented processes for surveillance planning and management. Actions NNSA has taken to implement the recommendations include the following:

- *The creation of a Senior Technical Advisor for Surveillance (senior advisor) position*. This position was created in response to the review's recommendation to establish strong NNSA leadership for the surveillance program. According to the official position description, the senior advisor is to serve as the agency's lead official for surveillance execution and integration and is responsible for providing direction and oversight to major surveillance modernization efforts. The senior advisor reports directly to the senior NNSA official responsible for overseeing stockpile activities related to research, development, design, and production.[28] NNSA designated an acting senior advisor in October 2010 and hired a permanent senior advisor in July 2011. According to NNSA officials, the senior advisor has brought leadership to the surveillance program. For example, when a dispute

[28]This official is the Office of Defense Programs' Assistant Deputy Administrator for Stockpile Management.

between national laboratory and production plant officials on the appropriate safety standards for handling a toxic chemical caused a backlog of a key component test, the acting senior advisor was able to mediate this dispute, and the component testing was resumed.

- *Establishment of a formal requirements-setting process*. NNSA formalized the process for having the national laboratories submit surveillance testing requirements and having NNSA's production plants evaluate the requirements. The process is being applied to surveillance testing requirements for fiscal years 2012 through 2017. Specifically, the national laboratories determine surveillance testing requirements; production plants review these requirements for technical feasibility and resource availability; and a new committee adjudicates unresolved conflicts in priorities. Previously, NNSA had set surveillance testing requirements informally and on an annual basis. National laboratories and production plant officials said that informal planning created problems in executing surveillance tests because, among other reasons, they did not have sufficient time to schedule tests around other stockpile work—such as life extension programs—that used the same personnel and equipment.

- *A new surveillance governance structure.* This structure is intended to promote integrated planning and prioritization as recommended by the management review. Elements of the new structure include the Surveillance Integrated Requirements Working Group (requirements group) and the Surveillance Enterprise Steering Committee (steering committee). Established in July 2011, the requirements group resolves mismatches between surveillance testing requirements and financial, human, and material resources. Specifically, this group examines surveillance testing requirements and assesses the impact of uncompleted tests. Established in May 2011, the steering committee is the highest-level organization in NNSA solely responsible for surveillance; the steering committee approves surveillance testing requirements and will resolve disputes between the national laboratories and the production plants that are not resolved by the requirements group.

- *Management of the requirements process through a centralized database called the Quality Evaluation Requirements Tracking System*. In line with the review's recommendation regarding critical communication and information pathways, NNSA will require each entity in the Core Surveillance process to use this system to input, access, or manage surveillance data. For example, within this system, the laboratories will issue surveillance testing requirements, and the

plants will track progress and document completion of tests. NNSA will use the data in this system as a basis for the formal performance measures the agency uses to hold the national laboratories and production plants accountable for the execution of surveillance activities.

- *Codification of surveillance governance and processes*. Codification supports the review's recommendation to implement a disciplined and integrated management process, with clear roles and responsibilities. NNSA is codifying surveillance governance and processes in section 5 of the *Requirements Management Integration* (RMI) manual.[29] When completed, this manual will include the charters for key entities in the newly established surveillance governance structure and clear delineation of roles and responsibilities, according to NNSA officials. The manual will also include at least 12 guidance documents to serve as project management tools. For example, one such document codifies the process for investigating anomalies identified through surveillance activities; another addresses the process for adjusting surveillance schedules or plans. The guidance documents are all currently in draft, with completion expected by the end of September 2012, according to NNSA surveillance program planning documents. The 2010 management review cited the critical need for clear roles and responsibilities for all individuals and committees throughout the surveillance enterprise; it found that the number of committees with undefined or poorly defined roles and responsibilities, combined with inadequate documentation, clearly contributed to NNSA's past difficulties in modernizing the surveillance program.

- *Better Integration of Core and Enhanced Surveillance*. As of August 2011, NNSA charged the managers of the Core Surveillance Program and the Enhanced Surveillance Campaign with defining integration points between them. NNSA also began developing an RMI guidance document detailing how the Enhanced Surveillance Campaign should develop new diagnostic tools. The 2010 review found that NNSA lacked a clearly defined interface between the Core Surveillance Program and Enhanced Surveillance Campaign and that the lack of a documented process for promoting integration, among other things, has resulted in the underutilization of Enhanced Surveillance Campaign capabilities in

[29]The RMI will replace NNSA's *Development and Production Manual* (NNSA Order AL-56XB), which currently serves as the authorization basis for Directed Stockpile Work activities—including stockpile surveillance.

the Core Surveillance Program's testing activities. In June 2011, the acting senior advisor told us that integration between Core and Enhanced Surveillance is central to the surveillance program's future and that increased integration presents a management challenge. Two of the surveillance program's objectives are to detect precursors of aging weapon components sufficiently early for corrective action in existing weapons and to ensure any defects are not repeated in life extension programs. According to NNSA officials, these objectives depend on the continued development of Enhanced Surveillance Campaign technologies that are then used to improve the number and scope of the Core Surveillance Program's component and material tests.

National laboratory and DOD officials we spoke with generally viewed NNSA's current and planned actions to improve the surveillance program as positive developments. However, these actions are not guided by a formal corrective action plan. According to an OMB circular that defines management's responsibility for internal control in federal agencies, federal managers are to develop a corrective action plan to address weaknesses found in program operations, as identified through management reviews, inspector general and GAO reports, program evaluations, and financial statement audits.[30] Corrective action plans are to include specific dates, assigned responsibilities, and metrics to measure progress to resolve the findings of audits and reviews. The circular also states that agencies should periodically assess and report on the progress of those plans. Furthermore, under the *Standards for Internal Control in the Federal Government*, federal managers are to take steps to ensure that the findings of audits and other reviews are promptly resolved by completing, within established time frames, all actions that correct or otherwise resolve the matters brought to management's attention.[31] A corrective action plan would provide a framework for such time frames, as well as a mechanism for holding management accountable for meeting the time frames. According to the acting senior advisor, NNSA did not address many of the findings and recommendations in its three previous surveillance program management reviews primarily because the agency did not have a specific approach

[30]Office of Management and Budget (OMB) Circular No. A-123, *Management's Responsibility for Internal Control* (Dec. 21, 2004).

[31]See GAO/AIMD-00-21.3.1.

for implementation. This statement echoes the 2010 draft management review finding that the prior reviews' recommendations were not implemented because, among other reasons, NNSA did not have a well-defined, documented process for executing the surveillance program. In May 2011, more than 6 months after NNSA issued its draft October 2010 management review, the acting senior advisor directed the steering committee to establish a working group to develop a plan to implement the review's recommendations, but both the scope and time frame of this plan remain uncertain. In the interim, NNSA officials have requested reports on individual actions taken to implement the review's recommendations but not on the agencywide effort to implement these recommendations. Without such a plan, it is unclear how NNSA will (1) ensure that the draft review's recommendations are fully implemented and (2) demonstrate to key stakeholders, such as Congress and DOD, that NNSA is committed to improving the surveillance program.

Conclusions

It is critical that U.S. nuclear capability continues to reassure our allies and deter potential adversaries. With most weapons currently in the stockpile having been produced over 20 years ago and being sustained beyond their original design lifetimes, it is a testament to NNSA, the national laboratories, and the production plants that DOD officials were confident that nuclear weapon limitations do not currently reduce the effectiveness of the nation's strategic deterrent. However, several factors raise concerns with the limitations and NNSA's management of them. First, some limitations require mitigation actions, which can impose logistical burdens, increased security risks, and war planning restrictions on the Air Force, Navy, and STRATCOM. DOD officials said they would have less flexibility in mitigating limitations in the future should the stockpile's size be reduced as future arms control agreements are pursued. Second, NNSA guidance on limitations does not always clearly communicate to DOD the potential impacts that limitations have on nuclear weapon operations, maintenance, and war planning and does not include all identified limitations; it is uncertain if the risks associated with limitations are comprehensively identified and analyzed. Third, NNSA's current list of nuclear weapon limitations may not reflect the most up-to-date information, and the joint DOD and NNSA military requirements review may not contain enough specificity to ensure a relevant and reliable count of limitations.

The stockpile surveillance program provides critical data that informs stockpile decisions. A smaller, aging stockpile calls for increasingly complex and time-sensitive data. NNSA's multiple actions taken in

response to recommendations in its draft 2010 surveillance program management review demonstrate the agency's commitment to improving the program. NNSA is planning to fully address the findings and implement the recommendations contained in its draft review. However, it is unclear how or if NNSA will do so because the agency has not developed a comprehensive corrective action plan in accordance with OMB Circular No. A-123 that details actions that agency personnel must take to implement the recommendations with specific dates, assigned responsibilities, and metrics to measure progress of this implementation. Completion of such a plan would provide the agency with a reasonable basis for ensuring that recommendations are fully implemented. Without such a plan, NNSA is in danger of not implementing many of the draft review's recommendations, as it failed to do in its three previous surveillance program management reviews. For example, previous delays in integrating Core and Enhanced Surveillance have been attributed, in part, to a lack of a documented process. Furthermore, the successful development and completion of a comprehensive corrective action plan would demonstrate to key congressional and DOD stakeholders NNSA's commitment to improving the surveillance program. Without such a plan, it is unclear how NNSA will provide itself and key stakeholders with these assurances.

Recommendations for Executive Action

To improve the processes used to test and report on the nation's nuclear weapons stockpile, we are making four recommendations to the Secretaries of Defense and of Energy and the Administrator of the National Nuclear Security Administration, as appropriate:

- To improve the clarity of information NNSA provides to DOD about nuclear weapon limitations, we recommend that the Secretary of Energy and the Administrator of the National Nuclear Security Administration, in coordination with the Secretary of Defense, (1) expand the guidance provided by NNSA to DOD so that it includes each existing limitation and (2) assess, and revise as appropriate, the guidance provided by NNSA to DOD to ensure it clearly describes the potential impacts that each limitation may have on nuclear weapon operations, maintenance, and war planning.

- To improve the reliability and relevance of information associated with limitations, we recommend that the Secretary of Energy and the Administrator of the National Nuclear Security Administration, in coordination with the Secretary of Defense, determine if the findings

of the joint DOD and NNSA military requirements review can be used to eliminate certain limitations.

- To increase confidence in NNSA's ability to fully address all findings and recommendations from its draft surveillance management review, we recommend that the Secretary of Energy and the Administrator of the National Nuclear Security Administration prepare and complete a comprehensive corrective action plan in accordance with OMB Circular No. A-123. This plan should identify the detailed actions that agency personnel must take to fully implement the recommendations in the review and include specific dates, assigned responsibilities, and metrics to measure progress of this implementation. This corrective action plan should also address how to better integrate Core and Enhanced Surveillance.

Agency Comments and Our Evaluation

We provided NNSA and DOD with a draft of this report for their review and comment. In its written comments, NNSA said that GAO did a commendable job in reviewing a highly complex and technical area. NNSA agreed with two of the four recommendations and "agreed in principle" with the other two recommendations. NNSA also outlined the actions that it plans to take to address all four of the report's recommendations. The complete text of NNSA's comments is presented in appendix I. NNSA also provided technical clarifications, which we incorporated into the report as appropriate.

For two of the recommendations, NNSA stated that the Assistant Deputy Administrator for Stockpile Management will oversee the development and execution of a corrective action plan for the nuclear stockpile surveillance program and ensure that the findings of the joint DOD and NNSA military requirements review be appropriately implemented. NNSA agreed in principle with the other two recommendations aimed at clarifying the information NNSA provides to DOD on nuclear weapon limitations. NNSA stated that it agrees with the desired outcome of these two recommendations, but NNSA concluded that a key procedural weakness in the process used to report on weapon limitations is the absence of a document that formally communicates DOD's position on limitations. NNSA said that it will ask the Nuclear Weapons Council to require that military service lead project officers provide NNSA with a consolidated DOD response each time a MAR is issued, and that this response could include any concerns with nuclear weapon limitations. We agree with NNSA that the management of nuclear weapon limitations requires active participation from both NNSA and DOD through the

Nuclear Weapons Council. If NNSA and DOD follow through with these planned actions, we believe that the agencies will be responsive to our recommendations.

In its written comments, DOD agreed with all four of the report's recommendations and said that the process by which nuclear weapon limitations are managed needs to be addressed. DOD said that it will coordinate with NNSA, through the Nuclear Weapons Council, to implement our recommendations. The complete text of DOD's comments is presented in appendix II.

We are sending copies of this report to the Secretary of Defense, the Secretary of Energy, the Administrator of NNSA, the appropriate congressional committees, and other interested parties. The report also is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or aloisee@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.

Gene Aloise, Director,
Natural Resources and Environment

List of Requesters

The Honorable John S. McCain
Ranking Member
Committee on Armed Services
United States Senate

The Honorable Jeff Sessions
Ranking Member
Subcommittee on Strategic Forces
Committee on Armed Services
United States Senate

The Honorable Michael R. Turner
Chairman
Subcommittee on Strategic Forces
Committee on Armed Services
House of Representatives

The Honorable Jon Kyl
United States Senate

The Honorable David Vitter
United States Senate

Appendix I: Comments from the National Nuclear Security Administration

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

JAN 20 2011

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

Dear Mr. Aloise:

The National Nuclear Security Administration (NNSA) appreciates the opportunity to review the Government Accountability Office's (GAO) draft report, GAO-12-188, *NNSA Needs to Improve Guidance on Weapon Limitations and Planning for its Stockpile Surveillance Program.*

In general, NNSA believes the GAO did a commendable job in reviewing this highly complex and technical area, and we agree with the underlying principle that it is undesirable to any extent for the Department of Defense (DoD) staff to either be uncertain as to the documented acceptability of any weapon limitation or unaware of NNSA's plans and activities to alleviate those which have been jointly determined as unacceptable. Overall, we agree with two of the four recommendations in the report, and agree with the desired outcome of the two remaining recommendations directed at "expanding guidance" from NNSA to DoD related to limitations and impacts of each. In general, we believe existing documents provided by NNSA partially fulfill the role suggested by GAO for the recommended guidance, and that additional action should be requested of DoD to formally communicate a consolidated response to limitations identified by NNSA each time a new MAR is issued.

I have enclosed a summary of our specific planned actions to address the four recommendations noted in the report. In addition, while the auditors have done a thorough job, I have also included general and technical comments to further clarify certain salient points in the report and/or improve the factual accuracy in selected areas.

If you have any questions related to this response, please contact Dean Childs, Director, Office of Management Controls and Assurance, at 301-903-1341.

Sincerely,

Kenneth W. Powers
Associate Administrator
for Management and Budget

Enclosure

Printed with soy ink on recycled paper

National Nuclear Security Administration Comments on GAO Draft Report
"NNSA Needs to Improve Guidance on Weapon Limitations and Planning for its stockpile Surveillance Program" GAO-12-188

Initial Response to Report Recommendations

Recommendation 1

"To increase the confidence in NNSA's ability to fully address all findings and recommendations from its draft surveillance management review, we recommend that the Secretary of Energy and the Administrator of the NNSA prepare and complete a comprehensive corrective action plan that, in accordance with OMB Circular A-123, identifies the detailed actions that agency personnel must take to fully implement the recommendations in the review, and that specific dates, assigned responsibilities, and metrics to measure progress of this implementation. This corrective action plan should also address how to better integrate Core and Enhanced Surveillance."

Management Response: Agree.

NNSA appreciates the report's recognition of the recent improvements NNSA has undertaken in the restructuring and resourcing of the weapon surveillance enterprise. We concur with your finding that this effort will be further enhanced by the development and execution of an action plan to ensure these efforts stay on track through completion. The Assistant Deputy Administrator for Stockpile Management will oversee this implementation.

Recommendation 2

"To improve the reliability and relevance of information associated with [weapon] limitations, we recommend that the Secretary of Energy and the Administrator of the NNSA, in coordination with the Secretary of Defense, determine if the findings of the joint DOD and NNSA military requirements review can be used to eliminate certain limitations."

Management Response: Agree.

NNSA enjoys an excellent relationship with our partners at the Department of Defense in developing realistic requirements and the weapon stockpile that fulfills them. We continue to take every opportunity to engage in refining the military needs of the nuclear weapon stockpile, and concur with your finding that the joint DoD – NNSA military requirements review provides another opportunity to identify requirements which may be obsolete and hence are unnecessarily drawing nuclear enterprise resources away from other priorities in our efforts to assess them. The Assistant Deputy Administrator for Stockpile Management will directly oversee the consideration of the findings of the review and implement the recommendations appropriately.

Recommendation 3 & 4

To improve the clarity of information NNSA provides to DoD about nuclear weapon limitations, we recommend that the Secretary of Energy and the Administrator of the NNSA, in coordination with the Secretary of Defense:

(1) expand the guidance provided by NNSA to DoD so that it includes each existing limitation;

Management Response: Agree in Principle.
NNSA agrees NNSA should provide guidance to DoD regarding weapons limitations. However, several documents already exist that complement the MARs in the communication of the technical impacts of weapon limitations. Foremost among these are the Annual Assessment Reports. However DoD similarly receives the biannual Weapon Reliability Reports, the annual Technical Basis for Stockpile Transformation Planning, and individual Significant Finding Investigation closeout reports. As such, the MARs should continue to contain short and concise statements of what few military requirements the weapons do not meet, and allow the assessment of technical impacts to be expanded by the other documents better suited and already in use for that purpose. No additional actions planned.

(2) assess, and revise as appropriate, the guidance provided by NNSA to DOD to ensure it clearly describes the potential impacts that each limitation may have on nuclear weapon operations, maintenance and war planning.

Management Response: Agree in Principle.
NNSA will continue to support DoD-led analyses to determine the operational, logistical, or strategic impacts of weapon limitations. However, findings in the report which imply a greater NNSA role in conducting or leading these efforts must recognize that the critical aspects necessary to determine these impacts include target engagement tactics, military service infrastructures, and theater employment scenarios. Authoritative direction to analysts on any of these inherently-DoD areas of responsibility exceeds NNSA's responsibilities. To the maximum extent possible, NNSA and its national laboratories will support DoD organizations with the technical data and analyses necessary to conduct its operational assessments. No additional actions planned.

General Comments on Recommendations 3 and 4

NNSA views as fundamentally sound the process by which assessment information is presented to the Department of Defense when a new or modified weapon is considered for admission into the stockpile, and how the Major Assembly Release (MAR) documents communicate the few limitations these weapons have in meeting the military requirements.

We agree with your report's underlying concern that it is undesirable to any extent for the DoD staff to either be uncertain as to the documented acceptability of any weapon limitation or

unaware of NNSA's plans and activities to alleviate those which have been jointly determined as unacceptable.

However, we view that the report's findings can also lead to a different, more valid conclusion; not that DOE has failed to adequately communicate the limitations, but rather that DoD needs a process to develop and communicate a consolidated response.

The key procedural weakness illustrated by the report's findings is the absence of a consistent process by which DoD reciprocates NNSA's formal communication of weapon limitations within a MAR with a written document back to NNSA on the acceptability of those limitations. Without documented institutional positions to provide your auditors (which if available the auditors would have referenced in the report), the interviewees provided professional perspectives which may not have been the official positions for their organizations, had they been formally staffed.

DoD and NNSA need the process for documenting the acceptability of a limitation to be as robust throughout the life of a weapon as it is when a weapon is first accepted into the stockpile. To this end, we will formally request that the Lead Project Officers coordinate every MAR with all DoD members on their weapon Project Officers Groups (POGs), and return a consolidated DoD response to all newly documented weapon limitations, such as capturing the acknowledgement and any concerns in the POG's official minutes signed by the LPO, or by a separate memorandum if necessary. We will additionally enjoin the Nuclear Weapons Council Standing and Safety Committee to levy this as a procedural requirement for all weapon POGs.

Defense Programs will also take steps to standardize the organization of content within the MARs. The Office of Nuclear Weapon Stockpile will work with the national laboratories to establish a consistent format for the Major Assembly Release to eliminate instances where a statement of weapon or component capability is misconstrued to be a limitation to a military requirement. We noted this occurred with at least two of the 'limitations' cited in your report.

Appendix II: Comments from the Department of Defense

ASSISTANT TO THE SECRETARY OF DEFENSE
3050 DEFENSE PENTAGON
WASHINGTON, DC 20301-3050

NUCLEAR AND CHEMICAL
AND BIOLOGICAL DEFENSE
PROGRAMS

JAN 24 2012

Mr. Gene Aloise
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 B Street, N.W.
Washington, D.C. 20548

Dear Mr. Aloise:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) draft report, 12-188, "NUCLEAR WEAPONS: NNSA Needs to Improve Guidance on Weapon Limitations and Planning for Its Stockpile Surveillance Program," dated December 12, 2011 (GAO Code 361215). The DoD concurs with all recommendations contained in the draft report.

Enclosed for your consideration is the DoD response to the audit findings and recommendations. As a summary, the DoD agrees that the process by which Major Assembly Release (MAR) limitations and exceptions are granted will need to be addressed. The DoD, through the Nuclear Weapons Council (NWC), will coordinate with the National Nuclear Security Administration for MAR limitations and exceptions to be briefed to the NWC, annually.

The DoD further agrees to support NNSA in reviewing military requirements to determine if certain limitations and exceptions can be eliminated. Results of this review may be briefed to the NWC.

If you have any questions, please call me at 703-697-3060. My point of contact for this action is Mr. David Court, 703-693-4304, david.court@osd.mil.

Sincerely,

Steve Henry
Deputy Assistant Secretary of Defense
(Nuclear Matters)

Enclosure:
As Stated

GAO DRAFT REPORT DATED DECEMBER 12, 2012
GAO-12-188 (GAO CODE 361215)

"NUCLEAR WEAPONS: NNSA NEEDS TO IMPROVE GUIDANCE ON WEAPON LIMITATIONS AND PLANNING FOR ITS STOCKPILE SURVEILLANCE PROGRAM"

DEPARTMENT OF DEFENSE COMMENTS TO THE GAO RECOMMENDATIONS

RECOMMENDATION 1: To improve the clarity of information NNSA provides to DoD about nuclear weapon limitations, the GAO recommends that the Secretary of Energy and the Administrator of the National Nuclear Security Administration (NNSA), in coordination with the Secretary of Defense, expand the guidance provided by NNSA to DoD so that it includes each existing limitation. (See page 21/GAO Draft Report.)

DoD RESPONSE: The DoD concurs with recommendation as written. The DoD, through the Nuclear Weapons Council (NWC), will coordinate with the NNSA on expanding guidance to ensure that all Military Characteristics (MCs) and Stockpile to Target Sequences (STSs) have been reviewed thoroughly through the weapon specific Project Officers Group (POG) Requirements Sub Group (RSG). Any MAR exception or limitation should clearly explain to the mission impact to DoD.

RECOMMENDATION 2: To improve the clarity of information NNSA provides to DoD about nuclear weapon limitations, the GAO recommends that the Secretary of Energy and the Administrator of the National Nuclear Security Administration (NNSA), in coordination with the Secretary of Defense, assess, and revise as appropriate, the guidance provided by NNSA to DoD to ensure it clearly describes the potential impacts that each limitation may have on nuclear weapon operations, maintenance, and war planning. (See page 22/GAO Draft Report.)

DoD RESPONSE: The DoD concurs with the recommendation as written. The DoD, through the NWC, will work with the NNSA and the weapon specific POGs to ensure that each weapon systems Requirements Sub-Groups have reviewed all MCs and STS requirements to address any new MAR limitations and exceptions. .

RECOMMENDATION 3: To improve the reliability and relevance of information associated with limitations; the GAO recommends that the Secretary of Energy and the Administrator of the NNSA, in coordination with the Secretary of Defense, determine if the findings of the joint DoD and NNSA military

requirements review can be used to eliminate certain limitations. (See page 22/GAO Draft Report.)

DoD RESPONSE: The DoD concurs with the recommendations as written. The DoD, through the NWC, will support the NNSA and the POGs in conducting a review of military requirements to determine if certain limitations can be eliminated..

RECOMMENDATION 4: To increase confidence in NNSA's ability to fully address all findings and recommendations from its draft surveillance management review, the GAO recommends that the Secretary of Energy and the Administrator of the NNSA prepare and complete a comprehensive corrective action plan that, in accordance with OMB Circular A-123, identifies the detailed actions that agency personnel must take to fully implement the recommendations in the review, and that specifies dates, assigned responsibilities, and metrics to measure progress of this implementation. This corrective action plan should also address how to better integrate Core and Enhanced Surveillance. (See page 22/GAO Draft Report)

DoD RESPONSE: The DoD concurs with the recommendation as written and looks forward to reviewing NNSA's development plan to ensure it meets DoD requirements for surveillance data needs.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

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