United States Government Accountability Office

GAO

Report to Congressional Requesters

October 2008

NUCLEAR SAFETY

Department of Energy Needs to Strengthen Its Independent Oversight of Nuclear Facilities and Operations

GAO-09-61

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GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-09-61, a report to congressional requesters

Why GAO Did This Study

The Department of Energy (DOE) oversees contractors that operate more than 200 "high-hazard" nuclear facilities, where an accident could have serious consequences for workers and the public. DOE is charged with regulating the safety of these facilities. A key part of DOE's self-regulation is the Office of Health, Safety and Security (HSS), which develops, oversees, and helps enforce nuclear safety policies. This is the only DOE safety office intended to be independent of the program offices, which carry out mission responsibilities.

This report examines (1) the extent to which HSS meets GAO's elements of effective independent nuclear safety oversight and (2) the factors contributing to any identified shortcomings with respect to these elements. GAO reviewed relevant DOE policies, interviewed officials and outside safety experts, and surveyed DOE sites to determine the number and status of nuclear facilities. GAO also assessed oversight practices against the criteria for independent oversight GAO developed based on a series of reports on DOE nuclear safety and discussions with nuclear safety experts.

What GAO Recommends

GAO recommends the Secretary of Energy take actions to address HSS's shortcomings in independent oversight of nuclear safety. DOE disagreed with the report's conclusions, but generally agreed with three of GAO's five recommended actions.

To view the full product, including the scope and methodology, click on GAO-09-61.
For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov.

What GAO Found

HSS falls short of fully meeting GAO's elements of effective independent oversight of nuclear safety: independence, technical expertise, ability to perform reviews and have findings effectively addressed, enforcement, and public access to facility information. For example, HSS's ability to function independently is limited because it has no role in reviewing the "safety basis"—a technical analysis that helps ensure safe design and operation of these facilities—for new high-hazard nuclear facilities and because it has no personnel at DOE sites to provide independent safety observations. In addition, although HSS conducts periodic site inspections and identifies deficiencies that must be addressed, there are gaps in its inspection schedule and it lacks useful information on the status of the safety basis of all nuclear facilities. For example, HSS was not aware that 31 of the 205 facilities did not have a safety basis that meets requirements established in 2001. Finally, while HSS uses its authority to enforce nuclear safety requirements, its actions have not reduced the occurrence of over one-third of the most commonly reported violations in the last 3 years, although this is a priority for HSS.

These shortcomings are largely attributable to DOE's decision that some responsibilities and resources of HSS and prior oversight offices more appropriately reside in the program offices. For example, DOE decided in 1999 to eliminate independent oversight personnel at its sites because they were deemed redundant and less effective than oversight by the program offices. DOE also decided in forming HSS in 2006 that its involvement in reviewing facility safety basis documents was not necessary because this is done by the program offices and adequately assessed by HSS during periodic site inspections. Moreover, DOE views HSS's role as secondary to the program offices in addressing recurring nuclear safety violations. Nearly all these shortcomings are in part caused by DOE's desire to strengthen oversight by the program offices, with HSS providing assistance to them in accomplishing their responsibilities. In the absence of external regulation, DOE needs HSS to be more involved in nuclear safety oversight because a key objective of independent oversight is to avoid the potential conflicts of interest that are inherent in program office oversight.

DOE Nuclear Facilities at the Hanford Site and Idaho National Laboratory

Source: DOE.

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Abbreviations

DOE	Department of Energy
HSS	Office of Health, Safety and Security
JCO	Justification for Continued Operation
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
PISA	Potential Inadequacies in the Safety Analysis
SBIS	Safety Basis Information System

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United States Government Accountability Office
Washington, DC 20548

October 23, 2008

The Honorable John D. Dingell
Chairman
Committee on Energy and Commerce
House of Representatives

The Honorable Bart Stupak
Chairman
Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
House of Representatives

The Honorable Sherrod Brown
United States Senate

The Department of Energy (DOE) is unusual among federal agencies in that it regulates and inspects the safety of its own nuclear facilities and operations, while the Nuclear Regulatory Commission (NRC) regulates virtually all other federal nuclear facilities and all commercial, industrial, academic, and medical users of nuclear materials.[1] The Congress gave DOE and its predecessor organizations the authority to regulate nuclear safety when they were formed. DOE self-regulation, however, creates a potential conflict of interest between meeting the mission objectives of the department while at the same time ensuring the proper independent emphasis on safety. This potential conflict was highlighted in a 2004 recommendation of the Defense Nuclear Facilities Safety Board (Safety Board) to DOE on ways to improve oversight of complex, high-hazard nuclear operations.[2] The Safety Board noted that the possibility of a nuclear accident at a DOE facility was growing, in part because there was increased emphasis on productivity at the possible expense of safety, and that there had been a reduction in central oversight of safety. The Safety Board

[1]Section 274 of the Atomic Energy Act of 1954, as amended, provides a statutory basis under which NRC relinquishes to Agreement States portions of its regulatory authority to license and regulate particular classes of nuclear material. There are presently 34 Agreement States.

[2]Defense Nuclear Facilities Safety Board, Recommendation 2004-1, Oversight of Complex, High-Hazard Nuclear Operations, May 21, 2004. The board was established by the National Defense Authorization Act, Fiscal Year 1989 (Pub. L. No. 100-456, September 29, 1988).

pointed out that despite a long and successful history of nuclear operations at DOE—during which DOE developed a structure and requirements to achieve nuclear safety—the Safety Board determined the need to recommend changes, including increasing central oversight of nuclear safety by the program offices at headquarters.[3] In addition, we reported in October 2007 on three DOE weapons laboratories with records of recurring accidents and violations of nuclear safety requirements.[4] We found that these events stemmed largely from lax implementation of safety procedures, weaknesses in identifying and correcting safety problems and inadequate oversight. There are 15 other DOE sites that have high-hazard nuclear facilities,[5] including two nuclear research reactors and other nuclear facilities for waste management, research, and weapons development.

DOE self-regulation of nuclear safety has three internal components. The program offices, both at headquarters and at DOE sites, have primary responsibility for nuclear safety, and also carry out the department's environmental cleanup, research, and national security missions. The program offices oversee the contractors that manage and operate DOE sites. The contractors are responsible for the safe design, construction, and operation of the nuclear facilities. To accomplish these tasks, contractors, among other things, need to prepare a technical analysis, known as the "safety basis," for each high-hazard nuclear facility to provide reasonable assurance that the facility can be constructed and operated safely. The safety basis is reviewed and approved by the program office as part of its authorization process for both the construction and operation of a nuclear facility. This authorization addresses both the design for operability and production, as well as safety. NRC found in its recent review of DOE regulatory processes at the Hanford Waste Treatment Plant that the department's approach to authorization, although similar in some respects to NRC licensing, is substantially different from

[3]The program offices with nuclear facilities at the sites that they oversee are the Office of Environmental Management, Office of Nuclear Energy, Office of Science, and the National Nuclear Security Administration (a semiautonomous agency within DOE).

[4]GAO, *Nuclear and Worker Safety: Actions Needed to Determine the Effectiveness of Safety Improvement Efforts at NNSA's Weapons Laboratories*, GAO-08-73 (Washington, D.C.: Oct. 31, 2007).

[5]DOE regulations (10 CFR part 830, appendix A to subpart B) define three categories of high-hazard nuclear facilities according to their potential to produce significant radiological consequences from an event that could either extend beyond the boundaries of a DOE site, remain within the boundaries of a site, or remain within the immediate vicinity of a nuclear facility.

NRC's implementation of its licensing activities.[6] For example, NRC found that DOE's use of a design-build approach for this plant leads to more significant changes in the authorization basis during the construction period, which makes the change-control process more important for ensuring safety under DOE regulation than it would under NRC regulation. In addition to program office oversight, DOE has an independent oversight office, the Office of Health, Safety and Security (HSS). HSS is responsible for policy development, independent oversight, enforcement, and assistance in the areas of health, safety, environment, and security. Among its functions are periodic appraisals of the environment, safety, and health programs at DOE sites, including evaluation of a sample of high-hazard nuclear facilities at these sites to determine if the program offices and their contractors are complying with DOE policies. The Secretary of Energy created HSS in October 2006, incorporating most of the responsibilities from the former Office of Environment, Safety and Health and the Office of Safety and Security Performance Assurance. HSS is the only office within DOE that oversees these programs without influence from the program offices, thus avoiding the potential conflict of interest inherent with program office oversight and helping to ensure public confidence in the department's ability to self-regulate nuclear safety.

In addition to the internal components of DOE self-regulation of nuclear safety, the department also considers assessments and recommendations from external organizations, most prominently the Safety Board. The Safety Board provides independent safety oversight of DOE defense nuclear facilities. These facilities are located at six Office of Environmental Management sites and seven National Nuclear Security Administration (NNSA) sites. The Safety Board has broad oversight responsibilities regarding these facilities and seeks to use informal interactions with DOE to resolve safety issues at these sites but also uses formal communications, such as recommendations, to typically address broader safety issues across the DOE complex. The Safety Board does not have the authority of a regulator but rather uses these forms of communication with DOE to implement what the board considers to be its statutory "action forcing" authorities. Other external organizations that provide assessments to the Secretary of Energy on the management of DOE sites include ad hoc review committees; DOE's Office of Inspector

[6]Nuclear Regulatory Commission, *Review of the U.S. Department of Energy's Regulatory Processes for the Hanford Waste Treatment Plant* (Washington, D.C., Aug. 12, 2008). NRC listed five important differences between the licensing and authorization processes, as indicated on page 82 of its report.

General; the Institute of Nuclear Power Operations, a nuclear industry evaluation and advisory organization; the National Academy of Sciences; in some cases, NRC; and GAO.

We have reported on the need for effective independent oversight of nuclear safety across the DOE complex, finding that a strong management and oversight program is needed to assure that DOE's nuclear operations are carried out in a safe and environmentally acceptable manner. Starting in 1977,[7] we argued for creating and strengthening an independent oversight office within DOE and its predecessor organization, the Energy Research and Development Administration. Notwithstanding our support for this office, we found that internal oversight alone was not sufficient to provide a fully independent review process. In a 1986 report,[8] we recommended that an external organization also review the safety basis for each new DOE nuclear facility, and we supported the establishment of the Safety Board. Even with the advisory oversight provided by the Safety Board, in the mid-1990s, the Congress considered legislation to externally regulate nuclear safety at DOE facilities and held hearings on this issue. Although no legislation was enacted, DOE responded by creating advisory committees to help formulate its position and to assess the benefits and costs of shifting away from self-regulation, if so directed. A 1995 DOE advisory committee report recommended that all aspects of nuclear safety should be externally regulated by an existing agency, either a restructured and enlarged Safety Board or NRC.[9] Over the next 3 years, a diverse team of DOE senior managers, NRC representatives, and interested stakeholders continued to review the external regulation approach for the department. In 1999, DOE decided not to pursue external regulation legislation based on its conclusion that the safety benefits of this change would be minimal when compared to the cost of external regulation. In contrast, we testified in 1999 and 2000 that transitioning DOE's nondefense research laboratories to regulation by NRC and the Occupational Safety and Health Administration seemed workable,

[7]GAO, *An Unclassified Digest of a Classified Report Entitled "Commercial Nuclear Fuel Facilities Need Better Security,"* GAO-EMD-77-40a (Washington, D.C.: May 2, 1977).

[8]GAO, *Nuclear Safety: Safety Analysis Reviews for DOE's Defense Facilities Can Be Improved*, GAO-RCED-86-175 (Washington, D.C.: June 16, 1986).

[9]DOE, *Improving the Regulation of Safety at DOE Nuclear Facilities*, Final Report of the Advisory Committee on External Regulation of Department of Energy Nuclear Facilities (Washington, D.C., December 1995).

followed by a phasing in of the defense nuclear facilities.[10] In 2002 and 2003,[11] we reported that external regulators could potentially regulate DOE more effectively and at less cost than the department. See appendix V for a discussion of two options that have been identified to externally regulate DOE nuclear facilities.

In considering legislation to establish the Safety Board in 1987, we identified some key elements that should be possessed by any nuclear safety oversight organization in order for it to provide effective independent oversight.[12] We developed these elements based on a long history of reviewing nuclear safety at DOE and supporting independent oversight. We have updated these elements for this report primarily through the addition of enforcement authority. We also discussed these elements with outside nuclear safety experts. The elements are:

- *Independence:* The organization should be structurally distinct and separate from DOE program offices to avoid management interference or conflict between program office mission objectives and safety.
- *Technical expertise:* The organization should have sufficient staff with the expertise to perform sound safety assessments.
- *Ability to perform reviews and require that findings be addressed:* The organization should have the working knowledge necessary to review a facility's compliance with nuclear safety requirements, developed through periodic reviews and it should also have sufficient authority to require the program offices to effectively address its review findings and recommendations.

[10]GAO, *Department of Energy: Uncertain Future for External Regulation of Worker and Nuclear Facility Safety*, GAO/T-RCED-99-269 (Washington, D.C.: July 22, 1999) and *Department of Energy: Views on Proposed Civil Penalties, Security Oversight, and External Safety Regulation Legislation*, GAO/T-RCED-00-135 (Washington, D.C.: Mar. 22, 2000).

[11]GAO, *Department of Energy: Observations on Using External Agencies to Regulate Nuclear and Worker Safety in DOE's Science Laboratories*, GAO-02-868R (Washington, D.C.: June 26, 2002) and *Department of Energy: External Regulation Savings in Safety and Health Activities at DOE Science Laboratories*, GAO-03-633R (Washington, D.C.: May 14, 2003).

[12]GAO, *Key Elements of Effective Independent Oversight of DOE's Nuclear Facilities*, GAO/T-RCED-88-6 (Washington, D.C.: Oct. 22, 1987).

- *Enforcement authority:* The organization should have sufficient authority to achieve compliance with DOE nuclear safety requirements.

- *Public access:* The organization should provide public access to its reports so that those most affected by operations can get facility information.

Given the importance of having a strong internal office to provide independent oversight of nuclear safety at DOE sites, this report examines (1) the extent to which HSS meets our elements of effective independent nuclear safety oversight and (2) the factors contributing to any identified shortcomings with respect to these elements. The objectives of our review were focused on whether the structure and functions of HSS allow it to provide effective independent oversight of nuclear safety. Our review was not intended to be a comprehensive assessment of safety management across the entire department.

To review the extent to which HSS meets our elements of effective independent nuclear safety oversight, we examined HSS's structure and functions with respect to nuclear safety. Because HSS was formed only in late 2006, we also examined the structure and functions of the offices that were combined to form this office, principally the former Office of Environment, Safety and Health and the former Office of Safety and Security Performance Assurance. Our elements of effective independent nuclear safety oversight came from combining two of the five elements from our 1987 report and adding enforcement authority as an element. We added enforcement authority because it was given to DOE at about the same time as the formation of the Safety Board but not considered in the legislative proposal that we assessed in this report. In some cases, we further defined these elements based on recommendations from our past reports, HSS guidance, and discussions with outside nuclear safety experts. We reviewed relevant DOE rules and directives; met with HSS and other DOE officials to discuss current and past oversight and enforcement practices; and obtained documents and interviewed officials at the Oak Ridge National Laboratory and Y-12 National Security Complex, as well as the Office of River Protection and the Richland Office at the Hanford Site. We also conducted a Web-based survey to obtain information on the number of high-hazard nuclear facilities owned by DOE and the status of the safety bases for these facilities. We assessed the oversight and enforcement practices of HSS and its predecessor offices against our elements of effective oversight, supplemented with past GAO recommendations and HSS guidelines. To determine the factors contributing to any identified shortcomings with respect to the five

elements, we analyzed documentary and testimonial evidence regarding possible contributing factors. In addition, we reviewed documents and conducted interviews to explore the capabilities and willingness of the Safety Board and NRC to take on additional responsibilities for regulating DOE nuclear facilities.

We conducted this performance audit from April 2007 through September 2008 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. A more detailed description of our scope and methodology appears in appendix I.

Results in Brief

DOE has structured its independent oversight office, HSS, in a way that falls short of meeting our key elements of effective independent oversight of nuclear safety. Specifically, HSS does not fully meet these key elements:

- *Independence*: HSS operates separately within the department from the program offices. However, HSS is not included in the safety basis review process for new nuclear facilities or for significant modifications to existing facilities, some of which may raise new safety concerns. Instead, this review process is conducted by the program offices at the DOE sites, which raises questions about the independence of this process. HSS also lacks its own representatives at DOE sites and the head of the office does not have a position comparable to program office heads from which to independently advocate for nuclear safety.

- *Technical expertise*: An HSS predecessor office, the Office of Environment, Safety and Health, had more than 20 technical experts in nuclear safety review positions—positions that do not exist in HSS. Moreover, HSS has vacancies for four nuclear safety specialists in two subordinate offices. For example, two of the five critical nuclear safety specialist positions in HSS's Office of Enforcement remain vacant. This HSS office and the Office of Independent Oversight have had to rely on personnel from other HSS offices, the program offices, and contractors to fulfill their responsibilities. In addition, with about half of its overall staff eligible to retire in the next 5 years, HSS plans to meet this challenge through special hiring authority and continued use of other federal personnel and contractors to maintain an adequate technical resource base.

- *Ability to perform reviews and require that findings be addressed*: HSS has some limitations in its nuclear safety review functions. First, we found that HSS lacks basic information about the high-hazard nuclear facilities it is supposed to oversee. As of December 2007, HSS did not have accurate information regarding the total number of these nuclear facilities or the number of facilities that lacked an approved safety basis meeting requirements set in 2001. We conducted a survey and identified 205 high-hazard nuclear facilities—31 did not have updated safety basis documentation. We also found that about one-third of the 205 facilities do not fully conform with DOE guidance to limit the time that temporary control measures can be used to allow a high-hazard nuclear facility to operate outside of its approved safety basis. Even though HSS is the only independent office with oversight of nuclear safety, it has no role in reviewing these operational decisions. Second, although HSS periodically inspects DOE sites and identifies program deficiencies, there are some gaps in meeting its internal guidelines to inspect sites with nuclear facilities at least every 2 to 4 years or more frequently, depending on the risks. We determined that HSS and a predecessor office did not inspect 8 of the 22 sites where high-hazard nuclear facilities are located in the last 5 years. Third, although the program offices are required to develop corrective actions in response to HSS inspection findings, HSS generally does not review the effectiveness of these actions until it returns to the same site for another inspection, which occurred approximately every 3 years on average since 2000 for the seven sites with the most high-hazard nuclear facilities (13 to 38 facilities), and on average every 6 years for the sites with two to seven high-hazard nuclear facilities.

- *Enforcement authority*: HSS has the authority to levy civil penalties and take other enforcement actions against contractors that violate nuclear safety requirements, but it has not been able to reduce some recurring violations. This is despite HSS guidance that prioritizes addressing long-standing and recurring violations with increased enforcement actions. We found that 9 of the 25 most frequently cited violations of DOE nuclear safety requirements occurred at the same or higher average frequency in 2007 as in 2005. We determined that while HSS had frequently conducted enforcement activities at the sites with the most high-hazard nuclear facilities, they were also the sites where the failure to perform work consistent with technical standards was the most common recurring violation.

- *Public access*: The public generally does not have access to HSS reports addressing environment, safety, and health deficiencies at sites with high-hazard nuclear facilities.

The shortcomings we identified in HSS with respect to the elements of effective independent oversight of nuclear safety are largely attributable to DOE's decision that some responsibilities and resources of HSS and its predecessor offices more appropriately reside in the program offices. First, DOE reduced the role of HSS and its predecessor offices to provide independent nuclear safety oversight largely to avoid redundancy and to improve relations with the program offices. For example, DOE eliminated the site representatives for an HSS predecessor office in 1999 because they were considered duplicative and less effective than program office personnel. Second, DOE reduced the technical expertise in nuclear safety reviews that might have been available to HSS by transferring in 2006 many of these technical positions from an HSS predecessor office to the program offices to strengthen their oversight capabilities. Third, the limitations in HSS's nuclear safety review functions substantially stem from the program offices having primary responsibility for most aspects of the review process. For example, HSS officials informed us that routine monitoring of the safety basis of all high-hazard nuclear facilities was not necessary because this was a program office function and adequately monitored on a periodic basis through HSS site inspections and other mechanisms. Likewise, HSS officials told us that the frequency of these site inspections is influenced by the scheduled assessments of the program offices and contractors and that the office is less involved in monitoring the effectiveness of actions to correct deficiencies identified in its site appraisals because this is primarily a program office responsibility. Fourth, HSS has not taken primary responsibility for preventing recurring nuclear safety violations because DOE views its role as secondary to the program offices. Finally, the lack of public access to some HSS nuclear safety information is due not to the formation of the office, but to heightened concerns over the possibility of attacks on nuclear facilities and to avoid alerting contractors and the program offices to potential enforcement actions.

We recommend that the Secretary of Energy take actions to strengthen HSS's independent oversight of nuclear safety by giving it the appropriate responsibilities, technical resources, and policy guidance. If DOE does not take appropriate actions, we are also including a matter for congressional consideration to strengthen independent oversight.

DOE, the Safety Board, and NRC provided written comments on a draft of this report, which are reprinted in appendixes VI, VII, and VIII, respectively. Each agency also provided detailed comments that we incorporated into the report, as appropriate.

DOE stated that the draft report was fundamentally flawed and disagreed with many of the report's conclusions, while in its detailed comments DOE generally agreed with three of our five recommended actions. According to DOE, the report was flawed because it evaluated HSS against GAO's preconceived opinion of functions that should be assigned to HSS. As the report noted, the objectives of our review were focused on whether the structure and functions of HSS allow it to provide effective independent oversight of nuclear safety with respect to our elements of effectiveness. Our review was not intended to be a comprehensive assessment of safety management across the entire department.

DOE rejected two of our recommendations as being expensive, redundant, and counterproductive to continuous improvement in nuclear safety. These two recommendations were to strengthen independent oversight by giving HSS responsibilities and sufficient technical resources to (1) review and concur on the safety basis for new nuclear facilities and significant modifications to existing facilities that might raise new safety concerns and (2) maintain a presence at DOE sites with nuclear facilities. We have revised these two recommendations to provide DOE with increased flexibility to implement them. DOE could implement them in a variety of ways that could be economical and efficient. For example, regarding the review of nuclear facility safety bases, DOE could rely on the existing expertise within HSS to conduct these reviews or it could shift technical staff from the nuclear safety oversight units within the program offices at headquarters (Central Technical Authority) into HSS. As for a site presence, HSS could perform more frequent and efficient site inspections or assign a minimal number of staff to sites with higher numbers of high-hazard nuclear facilities in order to promote greater awareness of site operations and to follow up on oversight findings and enforcement actions. The Safety Board did not comment on our recommendations but stated that the basic structure and authorities of the existing safety oversight organizations, including the board, provide a satisfactory framework for this function at those facilities under the board's jurisdiction. NRC did not comment on our recommendations but did explain that the current Commission has not expressed a view on expanding its oversight role beyond the DOE facilities already subject to NRC regulation. We made other changes to the report, where appropriate, to address detailed comments from these agencies.

Background

DOE has hundreds of nuclear facilities that are managed and operated for its program offices by contractors. DOE nuclear safety requirements define four categories of nuclear facilities based on the significance of their radiological consequences in the event of a nuclear accident.[13] Hazard category 1 nuclear facilities, such as the Advanced Test Reactor at Idaho National Laboratory, have the potential for significant off-site radiological consequences. Hazard category 2 nuclear facilities, such as the Tank Farms at the Hanford Site, have the potential for significant on-site radiological consequences beyond the facility but would be contained within the DOE site. Hazard category 3 nuclear facilities, such as the U-Plant at the Hanford Site, have the potential for radiological consequences at only the immediate area of the facility. The final category is below hazard category 3 nuclear facilities, which are not considered to be high-hazard. The following figures show photographs of each type of high-hazard nuclear facility.

[13]Appendix A to subpart B of 10 CFR 830.

Figure 1: Advanced Test Reactor at Idaho National Laboratory, a Hazard Category 1 Facility

Source: DOE.

Figure 2: Workers Changing Out Equipment at the Tank Farms at the Hanford Site, a Hazard Category 2 Facility

Source: DOE.

Figure 3: U-Plant at the Hanford Site, a Hazard Category 3 Facility

Source: DOE.

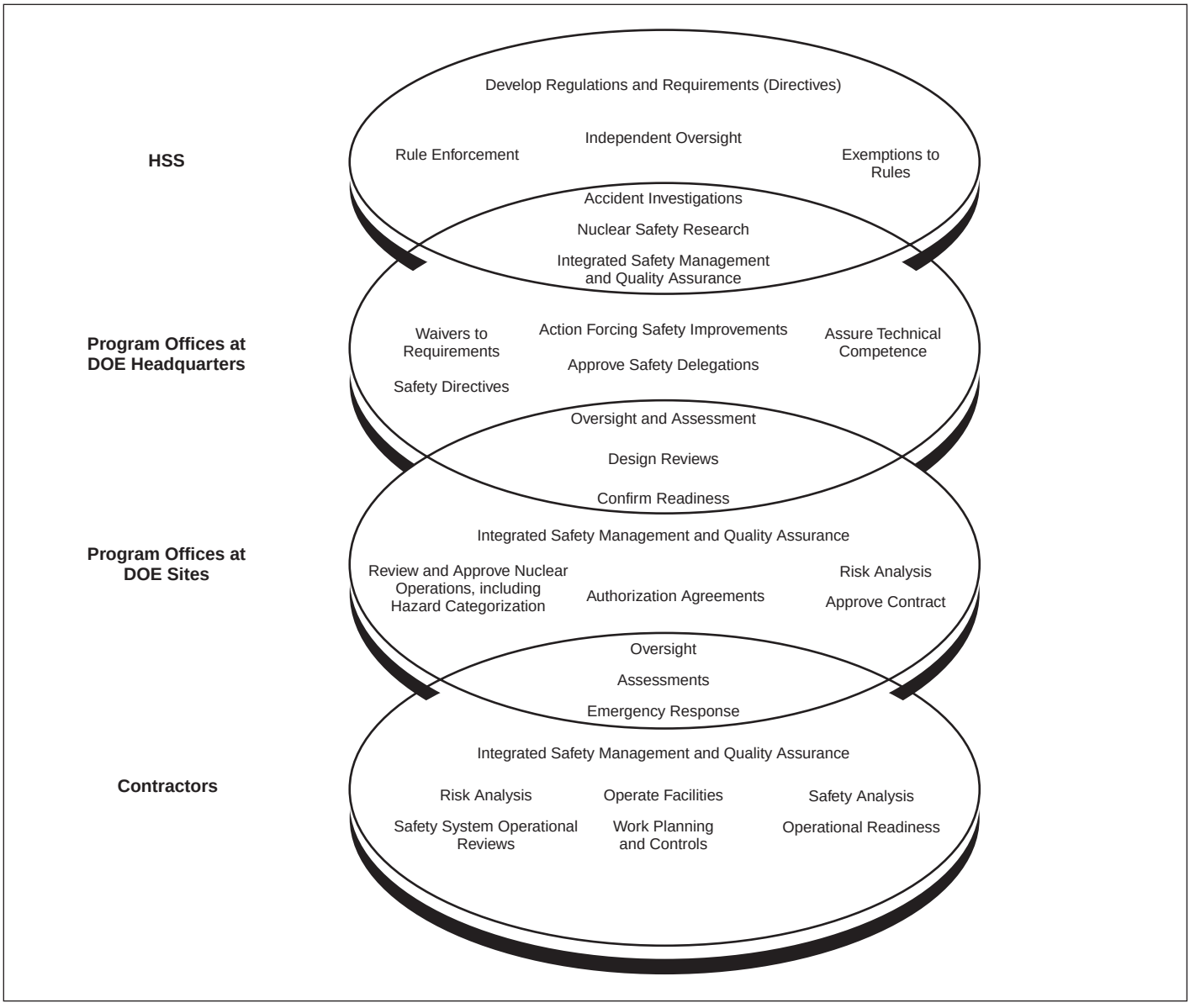
DOE nuclear safety requirements stipulate that high-hazard nuclear facilities require special attention by the program offices and their contractors. There are at least 29 DOE rules and directives related to and specifically developed for nuclear safety (see app. II). DOE's contractors must perform work in accordance with the department's nuclear safety requirements to ensure adequate protection of workers, the public, and the environment. DOE program offices are responsible for reviewing and approving the safety basis for the design, construction, and operation of high-hazard nuclear facilities and any changes to the safety basis proposed by a contractor. The documentation of the safety basis (1) describes the work to be performed; (2) evaluates all potential hazards and accident conditions; (3) contains appropriate controls, including technical safety requirements; and (4) delineates procedures and practices for operating the facility safely. When a contractor discovers an unexpected situation that is not covered by the approved safety basis, DOE policy allows the program offices to grant the contractor the ability to temporarily depart from safety basis requirements to avoid shutting down a facility. In such cases, contractors may submit to DOE a Justification for Continued

Operation (JCO) to amend the safety basis and address the unexpected situation. JCOs may include compensatory measures that must be employed until the situation is fully analyzed and addressed. DOE guidance suggests that JCOs should have a predetermined, limited life only as may be necessary to perform the safety analysis of the unexpected situation, to identify and implement corrective actions, and to update the safety basis documentations on a permanent basis. For example, a contractor recently discovered that a fire door leading to a room that stored nuclear material at Los Alamos National Laboratory was not safe. A JCO was employed, and all material was removed from the room until a new fire door was installed.

In DOE self-regulation of nuclear safety, HSS, the program offices at headquarters and the sites, and the contractors have overlapping roles, responsibilities, and authorities. This structure has existed for some time, but DOE clarified and institutionalized the responsibilities and requirements in a 2005 Order.[14] This order addresses the policy for quality assurance systems and processes to be followed by its contractors—including integrated safety management, which is an effort to ensure hazardous activities are carried out safely—and the oversight programs of the program offices and the independent oversight office, currently HSS. An important addition to the oversight of high-hazard nuclear facilities by the program offices at headquarters is the establishment of the Central Technical Authority in response to a 2004 recommendation of the Safety Board. DOE established a Central Technical Authority for NNSA, the Office of Science, and one for both the Office of Environmental Management and Office of Nuclear Energy to independently review the safety bases for nuclear facilities, provide guidance on implementing nuclear safety requirements promulgated by HSS, and maintain oversight of operations at the high-hazard nuclear facilities. Figure 4 depicts the roles, responsibilities, and authorities of these four organizations with respect to nuclear facilities.

[14]DOE, *Implementation of Department of Energy Oversight Policy*, Order 226.1 (Washington, D.C., Sept. 15, 2005).

Figure 4: Nuclear Safety Roles, Responsibilities, and Authorities for Nuclear Facilities



Source: DOE information edited by GAO.

Notes: Integrated Safety Management was launched in 1996 to respond to concerns raised by the Safety Board about the lack of formal, standardized procedures throughout DOE for ensuring that hazardous activities are carried out safely. The effort was intended to raise safety awareness and provide a formal process for employees to integrate safety into work activities. DOE defines quality assurance systems as encompassing all aspects of the processes and activities designed to identify deficiencies and opportunities for improvement, report deficiencies to all responsible managers, complete corrective actions, and share lessons learned effectively across all aspects of the operation.

In forming HSS, DOE decided that it needed to clarify the roles of its safety and security offices to provide a more focused and integrated approach. While emphasizing that primary responsibility for environment, safety, health, and security programs continue to reside with the program offices, the newly formed HSS was to provide these offices with more effective and consistent policy, oversight, enforcement, and assistance. This is not the first time that DOE has attempted to clarify the role of its independent oversight office. For example, in 1999, DOE took actions to address the dual role of the Office of Environment, Safety and Health, as the department's regulator—through its oversight and enforcement functions—and as a provider of technical assistance to the program offices. In the lead-up to the formation of HSS, DOE reported that the proposed office would be designed to help the program offices solve problems and improve environment, safety, health, and security programs and performance, so that DOE sites could better accomplish the department's mission and strategic goals.[15] Moreover, DOE stated that these changes would result in a "corporate safety office" that is focused on the most important headquarters safety functions and is organized to perform them more efficiently and effectively. In its final report establishing HSS, DOE stated that this office is intended to provide the corporate-level leadership and strategic vision necessary to better coordinate and integrate worker health and safety, the environment, and national security functions, working in partnership with the program offices.[16]

HSS has four key offices involved in nuclear safety policy, oversight, enforcement, and assistance: the Office of Nuclear Safety, Quality Assurance and Environment; Office of Independent Oversight; Office of Enforcement; and Office of Corporate Safety Analysis (see app. III for organization chart). The Office of Nuclear Safety, Quality Assurance and Environment is responsible for maintaining and improving nuclear safety and environmental policies and assisting the program offices in interpreting those policies and implementing safety programs. This office is to help the program offices solve problems and improve nuclear safety

[15]DOE, Office of Safety and Security Performance Assurance, *Proposed Approach for an SSA-EH Merger*, (Washington, D.C., May 19, 2006).

[16]DOE, *Strengthening the Department of Energy Worker Health, Safety and Security Functions: Creation of the Office of Health, Safety and Security* (Washington, D.C., August 2006).

and environmental programs and performance, working with other HSS offices to do so.

HSS's Office of Independent Oversight is responsible for the majority of independent oversight activities within DOE, as dictated through DOE orders.[17] To accomplish this responsibility, this office performs appraisals to verify, among other things, that the department's employees, contractors, the public, and the environment are protected from hazardous operations and materials. However, these appraisals are designed to complement, not duplicate, program office oversight and self-assessments. The appraisal program of the Office of Independent Oversight comprises inspections, follow-up reviews, special studies, and special reviews. Periodic inspections are the primary tool for assessing program performance at a specific site or location. Follow-up reviews are conducted to determine the status and progress of corrective actions and other activities being taken in response to deficiencies previously identified in an appraisal. Special studies are conducted to address concerns that transcend performance at a specific site or location, and special reviews are conducted at the request of the Secretary or other senior DOE managers, often on a rapid response basis, such as an accident investigation. In general, the inspections are a concentrated effort over a relatively short period of time, and the special studies take more time to complete.

In regard to nuclear safety, the Office of Environment, Safety and Health Evaluations, within the Office of Independent Oversight, is responsible for periodic inspection of DOE sites for compliance with environment, safety, and health requirements according to a priority-based schedule of site inspections.[18] Policy dictates that the inspection schedule take into consideration the number of facilities, diversity of site missions, and potential for off- and on-site radiological risks. The schedule also should consider other factors, such as current operations and facility conditions. According to the Independent Oversight Appraisal Process Protocols, the appraisals are to take a sampling approach designed to evaluate the

[17]DOE Order 470.2B, *Independent Oversight and Performance Assurance Program*, provides the basis for the independent appraisal function performed by HSS personnel, and DOE Order 226.1, *Implementation of Department of Energy Oversight Policies*, provides the overall framework of oversight for the department and its contractors.

[18]The Office of Independent Oversight comprises the Office of Environment, Safety and Health Evaluations; Office of Security Evaluations; Office of Cyber Security Evaluations; and Office of Emergency Management Oversight.

performance of environment, safety, and health programs at the sites. The findings contained in the appraisal reports are used to indicate significant deficiencies or safety issues that warrant focused attention by the program offices and contractors to correct the problems. According to DOE requirements, the program offices and their contractors must prepare corrective action plans to address these findings. The appraisal report can, when appropriate, also identify enhancements (opportunities for improvement) that can assist the program offices improve performance or implementation of the results of the appraisal, but they are only advisory. The program offices are also required to respond to comments from the Office of Independent Oversight on their proposed corrective action plans to address the appraisal findings. In cases where the Office of Independent Oversight and a program office cannot agree on the necessary corrective actions, the issue can be elevated to the Secretary or Deputy Secretary of Energy for resolution.

HSS's Office of Enforcement is responsible for worker safety and security, documentation of nuclear safety violations, on-site investigations, training for the enforcement coordinators who work for program offices at sites with nuclear facilities, and analyses of contractor-reported violations that are submitted to DOE's Noncompliance Tracking System.[19] The Office of Enforcement operates under the philosophy that the use of incentives and, when necessary, enforcement actions, such as civil penalties, will improve contractor performance, compliance, and fulfillment of mission objectives. This office has the authority to issue a notice of violation, enforcement letter, and compliance order to compel DOE contractors to operate in accordance with nuclear safety requirements.[20] Notices of violations, which can carry civil penalties (fines), are used to enforce the nuclear safety rules and requirements.[21] Enforcement letters are used to notify

[19]The Noncompliance Tracking System is a centralized, Web-based system that allows contractors to promptly report any noncompliance conditions that meet DOE's established reporting thresholds. These are conditions that are potentially more significant and thus are judged to need closer scrutiny by the Office of Enforcement.

[20]The Office of Enforcement comprises the Office of Price-Anderson Enforcement, the Office of Worker Safety and Health Enforcement, and the Office of Security Enforcement.

[21]Under section 234A of the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2282a, DOE has the authority to impose civil penalties on contractors for violations of nuclear safety requirements. However, under section 234A(d), certain nonprofit contractors (including the University of California, which currently operates Lawrence Livermore National Laboratory) were specifically exempted from paying such penalties. In 2005, the Congress passed the Energy Policy Act of 2005, which removed this exemption.

contractors of significant concerns that, if not addressed, could lead to a notice of violation. Compliance orders may be issued by the Secretary of Energy requiring actions to correct noncompliance conditions. The Office of Enforcement also has authority to conduct program reviews of contractor processes for identification and assessment, screening, reporting, and correction of issues. This office publishes an Enforcement Process Overview that describes the process but does not specify when and how often the enforcement tools will be employed. The approach is to generally investigate only those noncompliance conditions with greater safety significance than the general population of reported noncompliance conditions. The Office of Enforcement also shares lessons learned with the program offices to promote improvements within DOE and its contractor community.

A separate Office of Corporate Safety Analysis performs required reporting and regulatory coordination, manages certain DOE-wide programs, and analyzes data and trends for the department. For example, it maintains the Corrective Actions Tracking System and prepares quarterly reports for the program offices on implementation of the corrective actions.

HSS Falls Short of Fully Meeting Our Five Elements of Effective Independent Oversight of Nuclear Safety

HSS falls short of fully meeting our five key elements of effective oversight of nuclear safety: independence, technical expertise, ability to perform reviews and require that its findings are addressed, enforcement authority, and public access. First, we found that HSS has no role in reviewing the safety basis for new high-hazard nuclear facilities, no routine site presence, and its head is not comparable in rank to the program office heads. Second, HSS does not have some technical expertise in nuclear safety review and has vacancies in critical nuclear safety positions. Third, HSS lacks basic information about nuclear facilities, has gaps in its site inspection schedule, and does not routinely ensure that its findings are effectively addressed. Fourth, HSS enforcement actions have not prevented some recurring nuclear safety violations. Finally, HSS restricts public access to nuclear safety information.

HSS Has No Role in Reviewing the Safety Basis for New Nuclear Facilities, No Routine Site Presence, and Its Head Lacks a Rank Comparable to Program Office Heads

To be independent, an oversight organization should be structurally distinct and separate from the DOE program offices to avoid management interference or conflict between program office mission objectives and safety. While HSS is structurally distinct from the program offices, there are other components of independence that this office should possess—identified in past GAO reports—which are essential for HSS to function independently with respect to nuclear safety. These include (1) an independent role in reviewing the safety basis for new nuclear facilities or major modifications of existing facilities that may raise new safety concerns, (2) opportunities for independently observation of site operations on a routine basis, and (3) a head at the same rank as the program heads to independently advocate for nuclear safety. We found limitations in the structure and functions of HSS in each of these areas.

HSS has no responsibility for routine review of the safety basis for new high-hazard nuclear facilities or for significant modifications of existing facilities that may raise new safety concerns; necessary to provide reasonable assurance—independent of the program offices—that the facility can be operated safely in a manner that adequately protects workers, the public, and the environment. As far back as 1981,[22] we reported that the most practical reorganization option for nuclear safety oversight, in lieu of the preferred option of external regulation, was for DOE to establish a strong independent oversight office to mandate adherence to nuclear safety policies and standards. Such an office would guarantee program independence, uniformity, and public confidence in DOE self-regulation. In our 1986 report,[23] we noted that safety basis approval process was conducted by the program offices at the sites and that this did not represent an independent review process. In our 1988 report,[24] we not only recommended that the Congress establish an independent oversight organization for DOE's nuclear defense facilities (that became the Safety Board) but also that the safety and health functions of HSS's predecessor office, the Office of Environment, Safety and Health, be set in law to firmly establish its nuclear safety oversight responsibilities. In 1995, when DOE was assessing a shift away from self-regulation of nuclear safety, an advisory committee report recommended

[22]GAO, *Better Oversight Needed For Safety and Health Activities At DOE Nuclear Facilities*, GAO/EMD-81-108 (Washington, D.C.: Aug. 4, 1981).

[23]GAO/RCED-86-175.

[24]GAO, *Nuclear Health and Safety: Oversight at DOE's Nuclear Facilities Can Be Strengthened*, GAO/RCED- 88-137 (Washington, D.C.: July 8, 1988).

that in the preferred transition to external regulation, the Office of Environment, Safety and Health should, among other things, have this approval authority and exercise full authority and responsibility to inspect these facilities.[25] Instead, HSS relies on periodic site inspections that assess a sample of the environment, safety, and health programs of a site, including a sample of the documentation supporting the safe operation of any high-hazard nuclear facilities.[26] The Safety Board also performs reviews on defense nuclear facilities, including the design of new facilities, but it does not have a regulatory function.

HSS has no staff permanently assigned to DOE sites and thus cannot make routine, independent observations of nuclear safety at them. We found in our 1981 report that having field safety and health personnel solely within the program offices at DOE nuclear facilities did not allow for independent oversight, particularly with respect to overseeing the implementation of nuclear safety policies by the program offices. We recommended that these staff report to an independent oversight office to ensure the proper emphasis on safety and to increase public confidence in the credibility of the department's oversight. We noted that an on-site presence would permit frequent inspections and offer greater opportunities for day-to-day oversight, advice, and detailed knowledge of facility operations than would periodic site reviews by an independent oversight office. HSS primarily relies on periodic site inspections and the monitoring of information provided by program office facility representatives and enforcement coordinators, among other sources of information, to carry out its oversight responsibilities.

The head of HSS, as a career professional, does not have the same position or rank as the program office heads from which to independently advocate for nuclear safety. In reporting in 1977 on options to restructure federal nuclear oversight responsibilities, prior to the formation of the DOE, we stressed the need to insulate an independent oversight office from developmental functions of the organization to ensure an independent voice for nuclear safety.[27] Such action would include giving the head of the

[25]DOE, *Improving the Regulation of Safety at DOE Nuclear Facilities*.

[26]HSS refers to this as a vertical slice of nuclear safety at a visited site, which includes a sample of the nuclear facility safety basis, engineering design, operations, maintenance, surveillance, testing, configuration management, and oversight processes.

[27]At the time of our 1977 report, the organization we referred to was the Energy Research and Development Administration, a predecessor organization to the Department of Energy.

independent oversight office—appointed by the President and confirmed by the Senate—a specified term in office that would exceed the typical tenure of the head of the organization. In addition, this head should not be removed from office unless incapacitated or guilty of neglect of duty or malfeasance in office. Moreover, this head should have a professional background appropriate for the position, particularly with respect to nuclear safety. We continued to report on the need for such a position description in the 1980s. We found that absent a law establishing the position to head the independent oversight office, in the past, DOE was able to move this position to a lower level within the department—an action that could be considered a reduction in the visibility and attention given to environment, safety, and health issues by senior management, especially when compared with nuclear facility operations. In the 1988 report, we recommended that the Department of Energy Organization Act be amended to specifically establish the position of Assistant Secretary for the Office of Environment, Safety and Health in order to institutionalize this key component of DOE self-regulation of nuclear safety; however, this recommendation was never acted upon. Notwithstanding our past recommendations regarding this position, DOE officials have emphasized that the head of HSS has excellent access to the Secretary of Energy and other DOE decision makers and that the authorities of this position are at least equivalent to, and sometimes greater than, those of the head of HSS's predecessor offices. While this may be the situation in the current Administration, we point out that a future head of HSS may not retain the same level of access to the Secretary of Energy in another Administration.

HSS Does Not Have Some Technical Expertise in Nuclear Safety Review and Has Vacancies in Critical Nuclear Safety Positions

HSS does not have some technical expertise to help the program offices review the safety basis for high-hazard nuclear facilities that existed in a predecessor office. The predecessor Office of Environment, Safety and Health had more than 20 technical experts in nuclear safety fields that provided this service, but they were not transferred to HSS at its formation. Besides this lack of previous technical expertise in nuclear safety review, HSS still needs some expertise to fulfill its oversight and enforcement responsibilities. HSS currently has 4 vacancies for nuclear safety specialists to aid in making sound safety assessments. The Office of Independent Oversight is short 2 nuclear safety specialists to fulfill its staffing level of 14 technical experts, and the Office of Enforcement is short 2 such specialists to fulfill its staffing level of 5 technical experts after one vacancy was recently filled. However, HSS officials told us that these two offices can and do rely on other internal HSS resources, well-qualified and experienced contractors, and program office personnel to help fulfill their responsibilities.

HSS has been challenged to fill these vacancies in technical expertise and may be further challenged to address future vacancies with pending retirements from the workforce. HSS officials informed us about some difficulty in filling positions in nuclear safety related fields, in part because of competition for these specialists from other organizations, such as NRC. In addition, a senior HSS official informed us that about 56 percent of their workforce will be eligible for the early retirement program by the end of fiscal year 2009, but she anticipates that only 5 to 6 percent of the workforce will leave each year for the next several years. HSS plans to use recruitment, realignment, and training mechanisms to fill skills gaps within its approved budget and staffing authorization, and officials from this office told us they are confident they can address their technical staffing needs. Moreover, DOE officials explained that the department has supported HSS's efforts to designate certain nuclear safety specialist positions as critical hires and to maintain an adequate technical resource base, including a judicious balance of federal personnel and contractor support. Nevertheless, concerns about technical capabilities within DOE are long-standing. For example, the Safety Board identified deficiencies in technical expertise as an issue facing all of DOE in its first report to the Congress in 1991, and remains concerned today, despite the efforts made by the department over the years in this area. Moreover, the DOE Inspector General recently escalated DOE human capital management from its "watch list" to its "challenge list," given the department's aging and smaller workforce.[28] In commenting on a draft of this report, NRC also noted the well established human capital challenges associated with constructing, operating, and regulating nuclear facilities.

HSS Lacks Basic Information about Nuclear Facilities, Has Gaps in Its Site Inspection Schedule, and Does Not Routinely Ensure That Its Findings Are Effectively Addressed

HSS has the authority to and does conduct periodic environment, safety, and health program inspections of DOE sites with high-hazard nuclear facilities, but there are several limitations in its review functions. Our survey found that HSS lacks a comprehensive accounting of high-hazard nuclear facilities and the status of the safety bases for these facilities, which could provide additional information from which to direct its oversight activities. Moreover, we found that there have been extended periods of time between inspections of some sites with high-hazard nuclear facilities. Finally, while the program offices must address HSS site

[28]DOE Inspector General, *Special Report: Management Challenges at the Department of Energy*, DOE/IG-0782 (Washington, D.C., December 2007). In this report, the Inspector General reported that DOE will be challenged to ensure that its workforce has the knowledge and skills that are necessary to fulfill its various missions.

appraisal findings and respond to its comments on proposed correction actions, HSS primarily determines the effectiveness of the actions taken at the time of the next site inspection, which can take years.

HSS lacks a comprehensive accounting of nuclear facilities and the status of their safety bases. DOE has extensive safety basis requirements for designing, constructing, and operating high-hazard nuclear facilities, including requirements for how contractors should create and update safety documentation and procedures, and for program office reviews and approvals of the safety bases for the nuclear facilities. While HSS maintains a database that tracks some information on the safety basis status of high-hazard nuclear facilities—the Safety Basis Information System—it relies on the program offices to update facility information. In addition, HSS officials told us that their office is developing procedures for updating the system but has decided not to expend resources on validating information in the database. We raised concerns in our 1987 report, however, that the independent oversight organization should not be too dependent on program office information for developing its own findings and recommendations. In conducting our own survey of high-hazard nuclear facilities across the DOE complex, we found that the HSS database was out of date, listing more of these facilities than were indicated to us by the program offices at the sites.[29] We determined that DOE had 205 high-hazard nuclear facilities—2 category 1 facilities, 152 category 2 facilities, 45 category 3 facilities, and 6 that do not fit into one of the hazard categories.[30]

We also found that, as of December 2007, 31 of the 205 high-hazard nuclear facilities (about 15 percent) did not have an approved safety basis that meets current nuclear safety requirements. These requirements have been in place since 2001, when DOE required that contractors submit a safety basis for operating each high-hazard nuclear facility to the program offices for approval by April 10, 2003. We found that for 21 high-hazard nuclear facilities, old safety basis documentation had not been updated to current requirements, and for the 10 other facilities, initial safety basis documentation was still under development. HSS is currently not

[29]The number of high-hazard nuclear facilities across the DOE complex is not static because nuclear facilities are sometimes downgraded from a higher hazard category to a lower category.

[30]Six facilities fell into the "other" category on our survey. For example, one facility covered both hazard category 2 and 3 transportation activities.

responsible for routinely monitoring the safety bases status of high-hazard nuclear facilities, ensuring that contractors update them to current requirements or that this be done in a timely fashion.

The Idaho National Laboratory has about half of the high-hazard nuclear facilities that lack an approved safety basis that meets current requirements, and Los Alamos and Argonne national laboratories have several more. The safety bases for the Idaho National Laboratory nuclear facilities were approved under the previous program office and contractor in 2001, but the new program office and new contractor—which replaced previous management in 2004 and 2005, respectively—found inadequacies in the analyses supporting the previously approved safety bases documentation. The current program office, the Office of Nuclear Energy, is working with the contractor at this laboratory to upgrade the safety bases for these facilities but does not anticipate finishing all upgrades until 2012. In responding to a draft of this report, DOE explained that 2 of the 14 nuclear facilities at this site now have approved, upgraded safety bases, and that the Office of Nuclear Energy has put in place JCOs to address weaknesses in the previous safety bases of the other nuclear facilities until they can be upgraded, along with additional oversight. Also among the high-hazard nuclear facilities in this similar condition are three at the Los Alamos National Laboratory. For example, the Chemistry and Metallurgy Research Facility at this laboratory is operating under a safety basis established in 1998, although according to DOE, this facility has been subject to almost continuous safety review by both the contractor and the department. According to an October 2007 letter from the Safety Board, operating this facility in its current condition poses significant risk to workers and the public due to a number of serious vulnerabilities, such as the lack of a robust building confinement to prevent the release of radioactivity during an accident.[31] Moreover, an August 31, 2007, staff report to the Safety Board on the design, functionality, and maintenance of safety systems at Los Alamos National Laboratory stated that many of the deficiencies at the Chemistry and Metallurgy Research Facility and other nuclear facilities at this laboratory resulted in part from the lack of modern and compliant safety bases. Likewise, we found that seven nuclear facilities at Argonne National Laboratory lacked approved safety bases meeting current requirements. According to an official from this

[31]Defense Nuclear Facilities Safety Board, Reporting Requirements Letter to the Administrator, NNSA regarding safety concerns at the Los Alamos National Laboratory Chemistry and Metallurgy Research facility (Washington, D.C., October 23, 2007).

laboratory, while there are no obvious risks at these nuclear facilities, several have uncharacterized nuclear waste that has been in storage containers for many years and may pose a risk of explosion or fire.

HSS also does not routinely monitor changes to the safety bases of high-hazard nuclear facilities, such as use of JCOs, which allow facilities to temporarily depart from their safety basis to avoid shutting down operations. The Safety Board and DOE recently raised concerns about JCO usage at defense nuclear facilities. For example, the Safety Board noted in its April 19, 2007, recommendation to DOE that there were a number of weaknesses and deficiencies in the current JCO process, including JCOs that appear to have excessive durations. Moreover, the Safety Board found that the JCO approval process is site-specific and that none of the processes reviewed required the degree of analysis or rigor that would be expected for an important change or revision to the approved safety basis. Our survey found that, as of December 2007, nearly one-third (67 of 205) of the high-hazard nuclear facilities had at least one JCO in place with an average age of 340 days and an average total expected duration of 930 days.[32] Our survey results found that one JCO has been in effect since March 2003, the expected end dates for many other JCOs extended out several years into the future, and DOE officials did not report an expected end date for 27 other JCOs. This does not fully conform to DOE guidance that calls for JCOs to be temporary amendments to the safety basis with a predefined, limited life. In response to the Safety Board's concerns about JCOs, NNSA and the Office of Environmental Management issued informal guidance to the site offices to emphasize that JCOs are not to be used for planned activities. HSS's Office of Nuclear Safety, Quality Assurance and Environment has been working with the program offices to review the current guidance on JCOs. DOE officials explained that its internal review found that some aspects of the guidance were sufficient but new guidance on the content and approval of JCOs was warranted. DOE further explained that it is pursuing these improvements. Nevertheless, HSS officials told us that the office is not responsible for routine monitoring of JCO use and instead, reviews the use of JCOs only during periodic inspections of DOE sites.

[32]The Safety Board review of defense facilities found that there were nearly 50 JCOs in effect as of January 10, 2007. The age of these JCOs ranged from a low of about 2 months to a high of more than 4 years, with an average age of 434 days.

HSS conducts inspections of DOE sites, but there are extended periods of time between inspections at some sites with high-hazard nuclear facilities. The Office of Independent Oversight and its predecessors have conducted periodic inspections at DOE sites that resulted in appraisal reports containing deficiencies requiring program office corrective actions, but there have been lengthy periods of time between inspections of some sites with high-hazard nuclear facilities. We found that the Office of Environment, Safety and Health Evaluations within the Office of Independent Oversight largely met its own internal guidelines to periodically visit sites every 2 to 4 years that are judged to pose relatively high risk of exposure to radiation. However, we found that of the 22 sites that had at least one high-hazard nuclear facility over the last 5 years, 8 were not inspected during this time period.[33] We observed that one of these sites, the Office of River Protection, would be expected to have a site inspection at least every 2 to 2.5 years, according to HSS guidelines. However, in commenting on a draft of this report, DOE indicated that while HSS has not conducted a site inspection at the Office of River Protection since 2001, it did conduct a Type B accident investigation at this site after a 2007 tank farm accident. The other four sites are generally supposed to be inspected at least every 3 to 4 years,[34] which was not the case. We suggested in our 1987 report on key elements of effective independent oversight of nuclear facilities that in the absence of day-to-day oversight, such reviews should be done annually. We found that these periodic reviews are important to maintain a working knowledge of DOE safety issues and to assess program office response to review findings and recommendations. Moreover, we stated that more frequent reporting would allow review staff to develop a better understanding of the program operations, rather than on a one-time or sporadic basis. The following table shows the number of environment, safety, and health program inspections from 1995 to 2007 at each DOE site with high-hazard nuclear facilities, although such inspections include just a sample of the nuclear facilities at a site.

[33]Three of these sites—Fernald, Miamisburg/Mound, and Rocky Flats—largely completed environmental cleanup between 2005 and 2006 and have no remaining high-hazard nuclear facilities.

[34]HSS officials informed us that the office had conducted a special study, not a specific site inspection, which included the Office of River Protection site, among other sites, during this time period.

Table 1: Number of Environment, Safety, and Health Program Inspections from 1995 to 2007 at DOE Sites with High-Hazard Nuclear Facilities

DOE site	Current nuclear facilities[a]	No. of reviews[b]	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
Idaho	38	5	•		•		●		●						●
Oak Ridge	29	8		●		●	●		●	●		●	●		●
Hanford	23	5		●	●	●		•						●	
Savannah River	23	4		●		●					●			●	
Los Alamos	19	4			●			●			●			●	
Pantex	18	5			●			●		•	●			●	
Y-12	13	4			●		•				●	●			
Argonne	7	3			●			•				●			
Lawrence Livermore	7	5	•			•		●	●				●		
Sandia	6	4			•		•				●		●		
Nevada Test Site	5	4	•					•			●	●			
Paducah	5	2								•	●				
Hanford ORP	4	1							•						
Portsmouth	3	1								•					
WIPP	2	1						•							
New Brunswick	1	0		•											
Pacific Northwest	1	2					•					•			
West Valley	1	0											•		
Brookhaven	[c]	4	•								●	●	●		
Fernald	[c]	2										●		•	
Miamisburg/Mound	[c]	1										●			
Rocky Flats	[c]	3							•		•				•
Total	**205**	**68**	**4**	**3**	**7**	**4**	**5**	**7**	**5**	**4**	**9**	**8**	**4**	**5**	**3**

Source: Reports listed on the HSS Office of Independent Oversight Limited Access Web site.

Notes: In some years, the HSS Office of Independent Oversight conducted additional environment, safety, and health performance reviews that were not specific to a site office or were follow-up reviews, which are not reflected in this table.

[a]The number of nuclear facilities listed for each DOE site is the number of hazard category 1, 2, and 3 nuclear facilities at each site, as of December 2007. The number of these facilities is dynamic, as new facilities are constructed or existing nuclear facilities are downgraded to below hazard category 3.

[b]In some cases, reviews of a site office in a given year may have resulted in more than one report.

[c]These sites did not have any high-hazard nuclear facilities as of December 2007, with the exception of Brookhaven, which officially downgraded its hazard category 3 nuclear facility to below category 3 in April 2008.

HSS does not routinely determine the effectiveness of corrective actions until it performs another site inspection, which can take years. The Office of Independent Oversight has the authority to conduct follow-up reviews to determine the status and progress of the corrective actions to address deficiencies identified in its appraisal reports, but in practice, HSS officials informed us that they generally rely on the next site visit to check on the effectiveness of these corrective actions. We identified five such site-specific follow-up reviews listed in the Office of Environment, Safety and Health Evaluations' database of all appraisal reports since 1995. The time period between inspections of DOE sites, which in practice indicates when the effectiveness of the corrective actions can be independently assessed, is shown in table 1. We determined that the Office of Independent Oversight returned on average about every 3 years, since 2000, to the 7 sites with 13 to 38 high-hazard nuclear facilities. For sites with 2 to 7 high-hazard nuclear facilities, the office returned for another site inspection on average about every 6 years. For example, there was a 3-year period between a 2005 site inspection of Los Alamos National Laboratory and the 2008 site inspection before the Office of Independent Oversight reported that corrective actions taken to address some of its findings were not fully effective, as many of the same findings were cited again in the latest report. The Office of Independent Oversight's appraisal program leaves DOE with no routine independent assessment of corrective actions to determine if they are effective and timely in addressing identified deficiencies.

HSS Has Authority to Enforce Nuclear Safety Requirements, but Its Actions Have Not Prevented Some Recurring Nuclear Safety Violations

The use of HSS enforcement authority has not prevented some recurring nuclear safety violations, despite DOE requirements and Office of Enforcement guidelines to address this problem. The enforcement process under DOE procedural rules for nuclear activities dictates the consideration of factors that can increase the severity of the penalty, such as the duration of the violation, past contractor performance, and multiple examples of similar violations during the same time frame.[35] The Office of Enforcement has put the contractor community on notice that enforcement actions involving recurring issues will generally result in significantly greater civil penalties than would otherwise be the case. This office has indicated that recurring violations are not acceptable and reflect insufficient management commitment to safety.

[35]10 CFR part 820 Appendix A, subpart VI: Severity of Violations.

Based on our analysis, we found that even though HSS has the authority to enforce compliance with nuclear safety requirements, over one-third of the most frequently reported violations of these requirements continue to reoccur without abatement. We analyzed the number of specific conditions of noncompliance with the nuclear safety requirements that were contained in entries to the Noncompliance Tracking System from 2005 to 2007. Our analysis found that there were 178 different noncompliance conditions reported, or separate violations of the nuclear safety requirements,[36] and that the 25 most frequently cited conditions represented about 67 percent of this total. We determined that 9 of these 25 conditions of noncompliance occurred at the same or higher average frequency in 2007 as they did in 2005, despite an overall decrease in the number of nuclear safety violations over that time period. For example, contractors at some DOE sites repeatedly reported violating the same nuclear safety requirement for "performing the work consistent with technical standards," the most frequently recurring violation across the complex from 2005 to 2007. According to HSS officials, as this is a broad category that encompasses all instances of procedural violations and inadequate procedures, it is not surprising that this violation is cited in the overwhelming majority of the reported violations. Yet, it is a violation that meets DOE's reporting thresholds for safety significance and does in part reflect on the safety culture at these sites. Table 2 shows the number of times this violation has been self-reported by contractors at the DOE sites listed from 2005 to 2007.

Table 2: Reported Violations of the DOE Nuclear Safety Requirement to Perform Work Consistent with Technical Standards at Selected DOE Sites from 2005 to 2007,[a] by Frequency

DOE site[b]	Nuclear facilities	2005	2006	2007
Idaho	38	12	14	17
Oak Ridge	29	14	10	3
Hanford	23	15	14	7
Savannah River	23	1	16	11
Los Alamos	19	9	8	5
Pantex	18	1	4	2
Argonne	7	4	5	4

[36]Each entry into the Noncompliance Tracking System may contain more than one condition that violates DOE's nuclear and worker safety requirements.

DOE site[b]	Nuclear facilities	2005	2006	2007
Lawrence Livermore	7	11	9	7

Source: GAO analysis of the Noncompliance Tracking System database.

[a]Sites selected based on frequency of this violation. Data for 2007 is through October 15, 2007.

[b]In some cases, there may be more than one contractor operating at a DOE site.

The Office of Enforcement has frequently taken actions at those sites in table 2 that continue to violate this nuclear safety requirement and some others. As shown in table 3, this office has been active at those sites with the most high-hazard nuclear facilities through the use of notices of violations, enforcement letters, and program reviews. For the sites listed in table 2, the Office of Enforcement has had some type of contact in at least 2 out of the 3 years since 2005.

Table 3: Notices of Violation, Enforcement Letters, and Program Reviews at DOE Sites with High-Hazard Nuclear Facilities from 1995 to 2007

DOE site[a]	Nuclear facilitiies[b]	Notices, letters, and reviews	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
Idaho	38	26	●	●		●	●	●		●	●	●	●		
Oak Ridge	29	19		●	●	●	●	●	●			●	●		
Hanford	23	27	●	●	●	●	●	●	●	●	●	●	●	●	●
Savannah River	23	16		●	●	●	●	●	●	●		●	●	●	
Los Alamos	19	15	●	●		●	●	●	●		●	●	●	●	
Pantex	18	7		●	●	●				●	●		•		
Y-12	13	8	●	●		●	●	●		●	●				
Argonne	7	11		●	●				●	●	●		●	●	
Lawrence Livermore	7	11		●	●	●	●			●	●	●		•	
Sandia	6	7				●					●	●	●	●	
Nevada Test Site	5	9	•			●	●	●		●	●				
Paducah	5	0													
Hanford ORP	4	3	●	●		•									
Portsmouth	3	1			•										
WIPP	2	5		•		•		•		●	●				
New Brunswick[d]	1	0													
Pacific Northwest	1	4			●	●		•		•					
West Valley	1	2									●	•			
Brookhaven	[c]	8				●		●	●		●		●	●	
Fernald	[c]	8			●	●	●	●			●		●	●	

DOE site[a]	Nuclear facilitiies[b]	Notices, letters, and reviews	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
Miamisburg/Mound	[c]	7				•			•	•	•	•	•	•	
Rocky Flats	[c]	18				•		•	•	•	•	•	•	•	
Total	**205**	**212**	**11**	**12**	**15**	**25**	**19**	**16**	**11**	**27**	**22**	**20**	**19**	**13**	**2**

Source: GAO analysis of HSS Office of Enforcement data.

[a]Notices of violation, enforcement letters, and program reviews are issued to specific contractors, not DOE sites. In some cases, there may be more than one contractor operating at a DOE site.

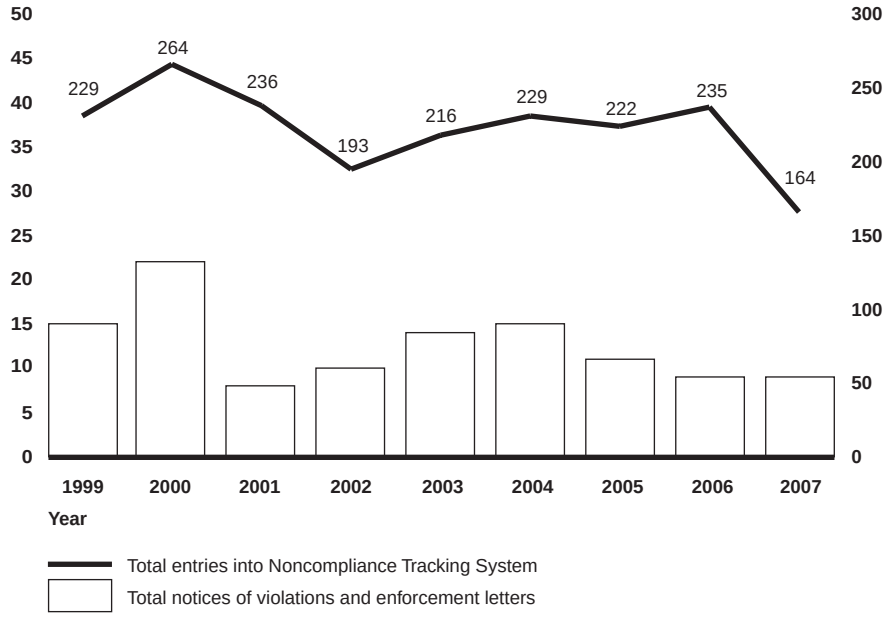
[b]The number of nuclear facilities listed for each DOE site is the number of hazard category 1, 2, and 3 nuclear facilities at each site, as of December 2007. The number of hazard category 1, 2, and 3 nuclear facilities is dynamic as new facilities are constructed or existing nuclear facilities are downgraded to below hazard category 3.

[c]These sites did not have any high-hazard nuclear facilities as of December 2007, with the exeption of Brookaven, which officially downgraded its hazard category 3 nuclear facility to below hazard category 3 in April 2008.

[d]New Brunswick Laboratory is operated by DOE, rather than a contractor, and therefore is not subject to enforcement actions by HSS.

The actual number of notices of violations and enforcement letters levied against contractors for violating DOE's nuclear safety requirements has been relatively small compared to the number of self-reported conditions of noncompliance that are entered into the Noncompliance Tracking System. Our analysis shows that voluntary entries into the tracking system have averaged around 220 per year since 1999, and the combined number of notices of violations and enforcement letters averaged about 12 per year during this time period. There was a slight reduction in the number of entries for nuclear safety violations between 2006 (235 entries) and 2007 (164 entries), representing approximately a 30 percent decrease in comparison to the previous 8-year average for nuclear safety violations. Figure 6 shows trends in the combination of notices of violations and enforcement letters with entries into the Noncompliance Tracking System from 1999 to 2007.

Figure 5: Trends in the Number of Notices of Violations and Enforcement Letters and Entries into the Noncompliance Tracking System from 1999 to 2007



Source: GAO analysis of DOE data.

Note: Under the new system for entering violations into the Noncompliance Tracking System, the total for 2007 would indicate 292 entries. However, this number includes 128 reported violations of the new worker safety and health requirements that HSS began to track in 2007. For comparison purposes, we are using only the number of nuclear safety violations.

One example of HSS enforcement actions is illustrated with events at the Office of River Protection site. Several events at this site in 2003 and 2004 led to a March 2005 civil penalty from the Office of Price-Anderson Enforcement of $316,250. In July 2007, another event, a spill of about 85 gallons of highly radioactive material at a different location at this site, was caused by the same contractor. This event resulted in a stop-work order at the tank farms, over $5 million in remediation and corrective action costs, $500,000 in fines from the Washington State Department of Ecology, a $30,800 fine from the U.S. Environmental Protection Agency, and a $500,000 contract fee reduction from DOE. A subsequent HSS accident investigation identified five issues related to the 2007 accident that were essentially the same as deficiencies the Office of Price-Anderson Enforcement identified in the 2005 notice of violation to the contractor. In June 2008, the Office of Enforcement fined the contractor $302,500 for the July 2007 accident. HSS officials told us that the safety performance of this contractor was a factor in DOE recently selecting a different contactor to manage and operate this site.

In a recent NRC report on DOE regulatory processes at the Hanford Waste Treatment Plant, NRC also pointed out recurring problems at the Office of River Protection site but with a different contractor. NRC found that recurring issues led to two enforcement actions and a 2008 notice of investigation. NRC stated that this could be indicative of program implementation issues in 2003 or 2004 that were not fully addressed and resolved as of 2008. NRC concluded that actions by the Office of Price-Anderson Enforcement and other underlying issues indicate that significant safety program and quality assurance functions, such as controls on noncompliance conditions and corrective actions, were not effective over an extended period of time.

HSS Restricts Public Access to Nuclear Safety Information

HSS currently restricts public access to some nuclear safety information that might be important to surrounding communities and other interested parties. We found that there were public access restrictions on reviewing the Office of Independent Oversight appraisal reports. Officials from this office informed us that access is generally restricted to DOE, contractor, and federal officials who can show a need to see this information. While the public can access information on the activities of the Office of Enforcement, the public does not have ready access to certain databases, such as the Noncompliance Tracking System. HSS officials informed us that interested members of the public can review pertinent entries into this database through the congressionally mandated public reading room but only after an investigation is closed. In addition to these restrictions, both offices do not have fully transparent decision-making processes for selecting sites to inspect, although they publish procedures for undertaking their investigations. In contrast, the public has access to Safety Board technical reports, letters, recommendations, and DOE's actions in response to the board's findings. Moreover, the weekly reports of the Safety Board site representatives, covering their day-to-day observations of nuclear operations at selected DOE sites, are also made available to the public. In addition, the Safety Board publishes an annual performance plan that explains how it chooses what to review and provides a detailed listing of planned reviews.

A Reduction of Responsibilities and Resources at HSS and Its Predecessors Was the Main Factor Contributing to Shortcomings in Effective Oversight of Nuclear Safety

The shortcomings we identified in HSS with respect to the elements of effective independent oversight of nuclear safety are largely attributable to reductions in its responsibilities and resources and in those of its predecessors. DOE took these actions to support the program offices, where it deemed these responsibilities and resources more appropriately reside. More specifically, DOE reduced the role of these offices in nuclear safety oversight largely to avoid redundancy and to improve relations with the program offices. Similarly, technical expertise has been transferred to the program offices to strengthen their oversight capabilities. Moreover, limitations in HSS review functions substantially stem from the program offices taking primary responsibility for most aspects of the nuclear safety review process. In addition, HSS has not taken primary responsibility for preventing recurring nuclear safety violations because DOE views its role as secondary to the program offices. Finally, HSS limits public access to nuclear safety information because it is concerned about security and possible counterproductive contractor and program office behavior.

DOE has reduced the role of HSS and its predecessors to provide independent nuclear safety oversight largely to avoid redundancy and to improve relations with the program offices. DOE began reducing the role of its independent oversight office with respect to nuclear safety after giving it significant responsibilities in the mid-1980s. In 1985, DOE restructured the Office of Environment, Safety and Health to give it more oversight tools and to integrate it into the operations of the department at all levels. For example, the Secretary of Energy at the time gave this office the authority to shut down any nuclear facility that presented a clear and present danger and also the authority to concurrently approve with the program offices the safety bases for new nuclear facilities and modifications at existing nuclear facilities.[37] However, in the late 1980s, DOE created a separate office reporting to the Secretary of Energy, the Office of Nuclear Safety, and gave it the authority for routine review of the safety bases for defense nuclear facilities. The Office of Environment, Safety and Health was assigned the role of assisting the program offices in their reviews but only had three staff members assigned to this task. When the Office of Nuclear Safety was shifted into the Office of Environment, Safety and Health in 1993, its responsibilities for routine review of the safety bases for defense nuclear facilities did not transfer. The transferred technical personnel, now in the Office of Environment, Safety and Health,

[37]DOE, *DOE Strengthens Authority of Assistant Secretary for Environment, Safety and Health*, DOE News (Washington, D.C., Nov. 18, 1986). While this authority was established by the Secretary of Energy, implementing actions were delayed and the next Secretary of Energy decided not to allow through with this approach.

were given the responsibility for providing assistance to the program offices if requested or as directed by the Secretary of Energy.

DOE has also eliminated the on-site presence for its independent oversight offices to in part reduce redundancies with program office personnel at the sites. The site representative program for DOE's independent oversight office began in 1988, when the Office of Environment, Safety and Health decided to place its own representatives at four DOE sites.[38] According to the then Deputy Assistant Secretary for this office, the site representatives provided valuable day-to-day observations of nuclear operations at these sites. For example, he told us that within months of their placement at the sites, site representatives located at the Savannah River and Rocky Flats sites documented safety problems that this official used to convince the Secretary and Under Secretary of Energy, as well as the pertinent program office, that a temporary shut down of some nuclear production facilities at these sites was warranted. These facilities were shut down, and at the time, he informed us that his office had the authority to review and approve restarting them. In 1990, the next Secretary of Energy moved the four site representative positions into the newly created Office of Nuclear Safety, which was given authority to routinely review the safety bases of defense nuclear facilities. The first head of the Office of Nuclear Safety immediately doubled the number of site representatives at the four sites. He informed us that these representatives were very effective and well trained and that the program offices and contractors did not like having them around. In 1993, the next Secretary of Energy merged the Office of Nuclear Safety into the existing Office of Environment, Safety and Health. In 1994, the site representative program peaked at 32 representatives at nine sites, although not all of them focused on nuclear safety.[39] However, by 1999, DOE had reduced the program to 19 site representatives at seven sites.

DOE shifted its position on the need for a site presence for its independent oversight office in 1999. At this time, a senior DOE official told us that the department began to view the independent site representatives as redundant and less effective in their oversight than the program office facility representatives, positions created in the early 1990s to provide independent assessments of safety to the site office managers. Moreover,

[38]The four locations were the Hanford Site, Idaho National Laboratory, the Savannah River Site, and the former Rocky Flats Site.

[39]The additional sites included Los Alamos National Laboratory, the Nevada Operations Office, Oak Ridge National Laboratory, the Pantex Site, and the San Francisco Operations Office.

HSS officials informed us that the unstated reasons behind the decision to eliminate a site presence for the Office of Environment, Safety and Health were that the site representatives no longer provided substantial value, there were significant difficulties in managing them from headquarters, the program offices began to complain about variability in their technical qualifications, and the contractors complained about getting conflicting directions. Following a 1999 comprehensive organizational review of the authorities and responsibilities of the Office of Environment, Safety and Health, DOE determined that its dual role as regulator and a resource for technical assistance was problematic. This finding led to the elimination of a site presence for the Office of Environment, Safety and Health. DOE decided instead to build up its facility representative and safety system oversight programs within the program offices. For example, at the Savannah River Site, DOE explained that there are now 30 facility representatives and 15 safety system oversight engineers. In addition, to compensate for the loss of this site presence, DOE decided that the Office of Environment, Safety and Health should increase the frequency of its periodic site inspections.

Finally, DOE put a career professional in charge of HSS, instead of a Senate-confirmed appointee, for several reasons, including a desire to improve relations with the program offices. In forming HSS, DOE determined that the head of HSS needed to ensure that the office had a clear mission and priorities, worked constructively with program offices, was accountable for performance, and provided value to the department. Moreover, HSS officials told us that this decision was based on the belief that a career professional would be more effective in maintaining corporate memory through the changes in administration, particularly with respect to the time necessary to sustain nuclear safety improvements. In addition, they told us that a career professional is less beholden to a political appointee and less apt to shade the oversight results to reflect well on the current administration. We observe that some of this justification for a career professional is in line with the position description we previously suggested to head the independent oversight office, except that the current position is not Senate-confirmed.

Technical expertise has been transferred to the program offices to strengthen their oversight capabilities. In forming HSS, DOE decided in large part to transfer more than 20 technical nuclear safety-related positions from the Office of Environment, Safety and Health—which had supported the safety bases reviews of the program offices—to these program offices to strengthen their review capabilities. DOE determined that while the program offices had gradually acquired more responsibilities and accountability for the review of the safety bases for

high-hazard nuclear facilities, most of this resided at the site offices and not headquarters. Responding to the 2004-1 Recommendation of the Safety Board, DOE decided to establish the Central Technical Authority within the program offices at headquarters in order to provide additional awareness and assessment capabilities for monitoring site operations with potential for high-consequence events, such as nuclear facilities and operations. The Safety Board letter noted, among other things, that there had been a reduction in central oversight of safety. DOE officials explained that the positions that were established to provide the review capabilities of the Office of Environment, Safety and Health were transferred to support the technical expertise needed by the Chief, Defense Nuclear Safety for NNSA and Chief, Nuclear Safety for the program offices at headquarters. These chiefs head small groups of technical experts that provide the operational awareness needed by the Central Technical Authority—the three Under Secretaries of Energy—to oversee implementation of nuclear safety by the program offices at the sites. This operational awareness is gained by having these technical staff monitor reports and performance metrics, review site-specific and DOE complex-wide technical and safety documents, and conduct site visits. The Safety Board has accepted DOE's approach to increasing central oversight of nuclear safety through this authority.

Limitations in HSS review functions substantially stem from the program offices taking primary responsibility for most aspects of the nuclear safety review process. HSS officials acknowledge some limitations in their review functions against our elements of independent oversight but generally point to them as being program office responsibilities. For example, they acknowledge that the information in the Safety Basis Information System is not current and may have some inaccuracies, but they do not take responsibility for monitoring this system or validating the information on the safety basis status of nuclear facilities entered by the program offices. The number of high-hazard nuclear facilities without a safety basis meeting requirements set forth in 2001, which our survey found, is similar to a situation we identified in the early 1980s. We reported in 1981 and 1983 that some nuclear facilities were operating without approved safety basis documentation, despite a 1976 agencywide requirement.[40] Moreover, we found that although the contractors had completed draft safety basis documentation for their high-hazard nuclear facilities 4 to 5 years earlier, DOE had yet to approve them because it did not give this effort enough priority. In 1985, the Office of

[40]GAO/RCED-86-175.

Environment, Safety and Health was given the responsibility for updating the status of major nuclear facilities across the DOE complex. Currently, HSS officials explained that they and the program offices do not use the Safety Basis Information System, as it was only put in place to allow the public to monitor DOE progress in upgrading high-hazard nuclear facilities to meet current safety basis requirements. Instead, they use other mechanisms, including accident reports, noncompliance tracking, Safety Board reports, program office reviews, and the periodic site inspections. In addition, HSS has not been given responsibility for ensuring the program offices bring the safety basis for high-hazard nuclear facilities into compliance with current requirements. Moreover, in commenting on a draft of our report, DOE stated that the new safety basis requirements envisioned a transition period for upgrading high-hazard nuclear facilities, so some delay is acceptable. Further, DOE stated that for some facilities that are scheduled for decommissioning, upgrading the safety basis may be an unwarranted expenditure of resources that provide little additional safety. However, updating the safety bases of these nuclear facilities is now 5 years past the 2003 deadline, and the process of decommissioning facilities can heighten safety risks.

HSS officials acknowledge that while there are gaps in meeting inspection frequency goals as defined in the appraisal process protocols, many of them are justifiable delays or otherwise allowed under the protocols. Office of Independent Oversight officials told us that staff have sometimes been shifted away from scheduled inspections when higher priority, unanticipated concerns arise, such as an accident investigation. In other situations, they told us that some sites are not inspected on schedule because these sites were in shut-down condition and a visit at the scheduled time interval would not have been useful. In addition, the site inspection protocols allow for less frequent visits to those sites that are determined to have effective self-assessment programs and acceptable ratings from past inspections. Finally, these officials told us that the Office of Independent Oversight does not want to return to a site too frequently because the program offices and contractors have complained about being overburdened with inspections, primarily their own. In addition, DOE officials told us that the technical staff to each Central Technical Authority is also expected to conduct comprehensive reviews of each site on a nominal 2-year cycle.

Finally, HSS officials also acknowledge that they are not routinely involved in assessing the effectiveness of the corrective actions taken by the program offices and their contractors to the appraisal findings because this is considered primarily a program office responsibility. According to an Office of Independent Oversight official, staff resources are better used to conduct

new site inspections than to conduct separate follow-up reviews to determine if the corrective actions effectively addressed findings from prior inspections. Nevertheless, we observe that in this area and other aspects of safety basis reviews, reliance on program offices to primarily conduct these activities can raise questions of conflict of interest.

NRC raised some concerns about reliance on program office oversight in its recent report of DOE regulatory processes at the Hanford Waste Treatment Plant. NRC found that DOE focuses its oversight program on ownership responsibilities rather than on nuclear safety requirements. Moreover, NRC found that because of dual roles and responsibilities and lack of independence of the oversight organization and staff—that is, in the Office of River Protection—oversight by this program office would not be considered equivalent to NRC's inspection program. For example, NRC stated that DOE's audit and assessment program was not effective in identifying issues with the safety program and quality assurance functions, determining the extent of conditions, and resolving issues. In addition, NRC determined that because the program office staff had both regulator and owner responsibilities, effective staff review time on ensuring nuclear safety was less than NRC would apply in regulating a similar facility. Despite the issues identified by NRC with DOE's regulatory processes at this high-hazard nuclear facility, NRC concluded that the DOE program, if properly implemented, is adequate to ensure protection of public health and safety at this DOE site. Nevertheless, NRC followed this conclusion with suggestions that DOE evaluate how to improve implementation of its requirements and the transparency of its decisions, and also explore ways to gain and maintain more independence between its regulatory oversight and project management functions.

HSS has not taken primary responsibility for preventing recurring nuclear safety violations because DOE views its role as secondary to the program offices. HSS officials acknowledge that there is clearly room for improvement across the DOE complex with respect to recurring safety events and nuclear safety deficiencies. Officials from the Office of Enforcement told us that while addressing recurring violations is an office priority, the responsibility for preventing the recurrence of nuclear safety events extends to a number of organizations within the contractor and program offices. According to these officials, the inability to eliminate recurring violations is not solely attributable to the enforcement program, as this is primarily a program office responsibility.

The program offices can and do use contractual mechanisms to penalize contractors for poor nuclear safety performance, as well as to encourage improved performance. These mechanisms include assessment reports

that dictate that a problem needs correction, showing cause letters, stopping work direction, conditional payment for fee actions, and contract termination. For example, HSS officials told us that since 2005, the Office of Environmental Management has exercised conditional payment of fee actions 10 times to penalize contractors for poor safety performance. While an evaluation of these mechanisms is outside the scope of this review, we pointed out in a 1999 report that shortcomings in the implementation of performance-based contracting by the program offices—as an important mechanism to encourage compliance with nuclear safety requirements—have limited the department's ability to hold contractors accountable for safe nuclear practices.[41] We therefore recommended approaches to strengthen the enforcement program at that time.

More recently, officials from the Office of Enforcement told us the office has escalated enforcement actions, where appropriate, including the penalty level, and has strongly encouraged contractors to perform more thorough root cause analyses of recurring violations. These officials also informed us that HSS plans to continue to help the program offices identify causes of recurrent violations through various means on both specific enforcement actions, such as through corrective actions, and on a program-wide basis, such as sharing lessons learned with enforcement coordinators, through conferences, and through other venues.

While there are few enforcement actions taken against DOE contractors each year compared to the number of reported nuclear safety violations, Office of Enforcement officials told us that they take every action required against contractors that have significant nuclear safety violations and that they have the technical resources to do so. Significant violations would include those with potential nuclear safety impact, a history of similar violations by the contractor, or the presence of negligent or malevolent intent, among other factors. In addition, these officials told us that the decrease in notices of violations and enforcement letters over the last 2 years is not unusually low and that variation from year to year is normal. They attributed the recent decline in the number of entries into its Noncompliance Tracking System to the hesitancy of some contractors to report violations and also to new responsibilities for reporting worker safety and health noncompliance conditions. These officials indicated to us that they have notified the contractors and program offices of this trend

[41]GAO, *Department of Energy: DOE's Nuclear Safety Enforcement Program Should Be Strengthened*, GAO/RCED-99-146 (Washington, D.C.: June 10, 1999).

and that they plan to initiate two program reviews in 2008 of contractors that could be underreporting violations.

NRC found in its review of DOE regulatory processes at the Hanford Waste Treatment Plant that there were some similarities and differences between the enforcement programs. NRC reported that DOE's enforcement requirements, guidance, and procedures contain many features that appear similar to the NRC enforcement process. For example, NRC also emphasizes the importance of its licensees identifying issues and implementing effective and complete corrective actions. However, NRC's enforcement process is usually initiated by its inspectors during routine inspections, when potential violations are normally noted and discussed with the licensee at the time or shortly thereafter, thus beginning the enforcement process. In contrast, HSS's Office of Enforcement has no presence at DOE sites to conduct independent routine inspections of specific facilities or programs for violations of the nuclear safety requirements, and its enforcement process takes a long time in comparison to NRC. NRC also noted differences in the threshold for taking an enforcement action—NRC has a low threshold for the significance of an event warranting an enforcement action compared to the consistently high threshold used by HSS.

HSS limits public access to nuclear safety information because it is concerned about security and possible counterproductive contractor and program office behavior. HSS officials acknowledge that they have restricted public access to Office of Independent Oversight appraisal reports but that this was done for national security reasons after the terrorist attacks on September 11, 2001. However, HSS officials told us in May 2008 that the office is considering allowing public access to the Office of Independent Oversight's Web site for unclassified appraisal reports. HSS has also restricted access to the data and processes it uses for various reasons. For example, Office of Enforcement officials informed us that information contained in the Noncompliance Tracking System is considered predecisional information that has the potential to lead to a federal investigation, and on that basis, it is inappropriate to make it publicly available. In addition, they informed us that the forms and specific written description of the Office of Enforcement's screening process have not been made publicly available but that they have discussed this process with the program offices and contractor community. They have not disclosed more because they are concerned that this might limit enforcement flexibility and provide an opportunity for contractors to slant reported noncompliance conditions in a way that affects the outcome of the screen, without providing a commensurate benefit. We were also told

that this screening process is not shared with the program offices, including the program office enforcement coordinators at the sites.

Conclusions

DOE's ability to effectively self-regulate its high-hazard nuclear facilities not only depends on vigorous oversight of contractors by the program offices, but also on active oversight of the contractors and program offices by an internal independent oversight office with no program responsibilities. Nearly all of the shortcomings in HSS with respect to our elements of effective independent oversight of nuclear safety are primarily attributable to DOE's desire to strengthen the oversight of the program offices by concentrating the necessary responsibilities and technical resources within them. In part, this has been accomplished by removing some important nuclear safety oversight responsibilities and technical resources from HSS and its predecessors. Essentially, DOE's approach to self-regulation rests on the assumption that personnel within the program offices can overcome any conflicts of interest in achieving program objectives while ensuring safety and that the current level of independent oversight and enforcement of nuclear safety by HSS is appropriate. In forming HSS, DOE decided to focus this office on providing the program offices, with the assistance and the tools necessary to solve problems and to improve performance, so that DOE sites can better accomplish the department's missions and strategic goals. This is not the first time that DOE has altered the role of its independent oversight office with respect to nuclear safety. Over the years, DOE has been able to change this role because the responsibilities and authorities of this office with respect to nuclear safety are not set in law.

In our view, DOE needs to strengthen HSS as an independent regulator of nuclear safety within its self-regulation approach. Using our elements of effective independent oversight, along with supporting criteria from our past work and current HSS guidance, we have concluded that HSS needs more direct awareness of site operations, greater involvement in facility safety basis reviews and monitoring, and stronger enforcement actions to address recurring violations of nuclear safety requirements. We believe that increasing HSS's involvement in nuclear safety could increase public confidence that DOE can continue to self-regulate its high-hazard nuclear facilities and decrease the likelihood of a low-probability but high-consequence nuclear accident. In the August 2008 NRC report on DOE's regulatory processes for the Hanford Waste Treatment Plant, NRC concluded that DOE's program, if properly implemented, is adequate to ensure protection of public health and safety at this DOE site. However, NRC also suggested that DOE evaluate how to improve implementation of

its requirements and the transparency of its decisions and explore ways to gain and maintain more independence between its regulatory oversight and project management functions. We believe that strengthening HSS's role in overseeing nuclear facilities and operations and establishing HSS responsibilities in law if necessary, would do more to gain and maintain independence between these functions than would any procedural changes within the program offices.

Recommendations for Executive Action

We recommend that the Secretary of Energy take actions to strengthen HSS's independent oversight of nuclear safety. Such actions would include giving HSS the responsibilities, technical resources, and policy guidance necessary to

1. review the safety basis for new nuclear facilities and significant modifications to existing facilities to ensure there are no safety concerns;

2. monitor the safety basis status of high-hazard nuclear facilities and ensure that all such facilities operate under current nuclear safety requirements, including the appropriate use of Justifications for Continued Operations;

3. increase a presence at DOE sites with nuclear facilities to provide more frequent observations of nuclear safety, provide more independent information to facilitate any necessary enforcement actions, and more routine monitoring of the effectiveness of corrective actions taken in response to HSS findings of deficiency;

4. ensure that enforcement actions are strengthened to prevent recurring violations of the nuclear safety requirements; and

5. establish public access to unclassified appraisal reports.

Matter for Congressional Consideration

If the Secretary of Energy does not take appropriate actions on our recommendations, the Congress should consider permanently establishing in law the responsibilities of HSS as noted above with respect to nuclear safety or shifting DOE to external regulation by

1. providing the resources and authority to the Safety Board to oversee all DOE nuclear facilities and to enforce DOE nuclear safety rules and directives.

2. providing the resources and authority to NRC to externally regulate all or just the newly constructed DOE nuclear facilities.

Agency Comments and Our Evaluation

DOE, the Safety Board, and NRC provided written comments on a draft of this report, which are reprinted in appendixes VI, VII, and VIII, respectively. Each agency also provided detailed comments that we incorporated, as appropriate. More detailed comments on DOE's letter appear in appendix VI.

DOE stated that the draft report was fundamentally flawed and disagreed with many of the report's conclusions, while in its detailed comments DOE generally agreed with three of our five recommendations. According to DOE the report was flawed because it evaluated HSS against GAO's preconceived opinion of functions that should be assigned to HSS. As the report noted, the objectives of our review were focused on whether the structure and functions of HSS allow it to provide effective independent oversight of nuclear safety with respect to our elements of effectiveness. Our review was not intended to be a comprehensive assessment of safety management across the entire department.

DOE rejected two of our recommendations. Specifically, DOE disagreed with our recommendations to strengthen independent oversight by giving HSS responsibilities and sufficient technical resources to (1) review and concur on the safety basis for new nuclear facilities and significant modifications to existing facilities that might raise new safety concerns and (2) maintain a presence at DOE sites with nuclear facilities to provide day-to-day observations on nuclear safety, provide information to facilitate any necessary enforcement actions, and to monitor the effectiveness of corrective actions taken in response to HSS findings of deficiency.

Regarding the first recommendation concerning review and concurrence by HSS on the safety basis for high-hazard nuclear facilities, we believe that this is an appropriate function for an independent oversight office within DOE's approach to self-regulation. Even DOE's advisory committee on external regulation reported in 1995 that the independent oversight office should be granted this responsibility and authority in the transition to external regulation by NRC. The Safety Board also has independent review responsibilities for the safety bases for nuclear facilities and authority to force DOE to respond to its assessments. An HSS predecessor office had the technical expertise to perform these reviews—now transferred to the program offices at headquarters—and, as DOE

explains, HSS still retains significant expertise to conduct such reviews, which it currently uses on a periodic basis through its site inspection program. We did, however, alter this recommendation to remove the need for HSS to concur with the safety basis in order to provide DOE with increased flexibility in using HSS in this review process.

Regarding the second recommendation that HSS maintain a presence at DOE sites with high-hazard nuclear facilities, we believe that this is consistent with our previous recommendations and it is an essential component of a nuclear safety oversight organization that is supposed to function independently from the program offices, which have both safety and mission responsibilities. We did, however, alter this recommendation to state that HSS should increase its presence at DOE sites, rather than stipulate that it maintain a day-to-day presence.

DOE stated that implementing these two recommendations would be expensive, redundant, and counterproductive to continuous improvement in nuclear safety, citing past experiences but offering no supporting analysis of impacts. DOE could implement these two recommendations in a variety of ways that could be economical and efficient. For example, regarding review of nuclear facility safety bases, DOE could rely on the existing expertise within HSS to conduct these reviews or it could shift technical staff from the nuclear safety oversight units within the program offices at headquarters (Central Technical Authority) into HSS. As for an HSS site presence, DOE could have this office perform more frequent and efficient site inspections or assign a minimal number of staff to sites with higher numbers of high-hazard nuclear facilities in order to promote greater awareness of site operations and to follow up on oversight findings and enforcement actions.

In addition, DOE raised questions about the credibility of our evaluation that centered on three primary areas. First, DOE commented that by focusing on HSS's responsibilities in isolation rather than as one element of DOE's approach to nuclear safety, the draft report appeared to be based on the incorrect premise that DOE program and site offices are inherently ineffective and that all DOE oversight must be performed by HSS. Second, DOE states that the draft report lacked balance and selectively quoted information out of context. Third, DOE stated that the draft report drew erroneous conclusions based on an incomplete understanding of HSS's mission and was oversimplified because it was developed by individuals with limited expertise in nuclear safety and with DOE's approach to nuclear safety. We disagree with these contentions.

First, the objectives of our review were focused on whether the structure and functions of HSS allow it to provide effective independent oversight of nuclear safety. Our review was not intended to be a comprehensive assessment of safety management across the entire department. HSS is a critical component of DOE's self-regulation approach because it is the only DOE safety office intended to be independent of the program offices, which carry out the department's mission responsibilities. Contrary to DOE's assertion, we do not believe, nor did our draft report state, that DOE program offices are inherently ineffective or that all DOE oversight must be performed by HSS. Our draft report clearly noted that DOE's ability to effectively self-regulate its high-hazard nuclear facilities depends on vigorous oversight of contractors by the program offices. However, we do believe that the program offices inherently lack independence and require oversight by an independent office with no program responsibilities.

The concept of independent oversight is at the heart of our report. In any program subject to safety regulation, the regulated entity is ultimately responsible to ensure safety. This fact does not diminish the need for independent oversight. DOE program offices face competing and often conflicting goals of maximizing project performance and minimizing cost. The steps necessary to ensure safety and to independently validate these steps can run counter to achieving mission objectives. For example, in its comments, DOE cites the Facility Representative Program, which is managed by the program offices and provides an on-site presence at DOE nuclear facilities as a more extensive and more effective program than existed with HSS predecessor offices. However, the facility representatives have other responsibilities beyond safety, namely helping to ensure that program goals are achieved in a cost-effective manner. While the program offices will always have a critical role in ensuring safety and the usefulness of the Facility Representative Program is not in dispute, these activities are not a substitute for oversight by an office that is focused solely on safety and is independent from other mission responsibilities.

Second, we also disagree with DOE's comment that the draft report lacked balance and selectively quoted information out of context. For example, contrary to DOE's claim, we detailed why DOE eliminated the independent site representative program, both in the Results in Brief section and in the body of the report. Moreover, in our discussion of NRC's review of DOE regulatory processes at its Hanford Waste Treatment Plant, which DOE cites as an example of selective quotation, we provided examples of both positive and negative findings by NRC. Specifically, we noted that NRC

reported that DOE's enforcement requirements, guidance, and procedures contain many features that appear similar to the NRC enforcement process. To address DOE's concerns, we have added NRC's conclusion that, if properly implemented, DOE's program is adequate to ensure protection of public health and safety. However, this does not negate NRC's suggestion following its conclusions that DOE should explore ways to ensure its regulatory oversight is independent from its project management functions.

Third, we disagree with DOE's comments that the draft report draws erroneous conclusions based upon an incomplete understanding of HSS's mission and that the report was oversimplified because of limited expertise with DOE's approach to nuclear safety. Our draft report discussed HSS's different functions and had extensive detail on the nuclear safety related functions of HSS's Office of Enforcement; Office of Independent Oversight; Office of Environment, Safety, and Health Evaluations; and Office of Corporate Safety Analysis. DOE illustrates what it calls our lack of complete understanding of HSS's mission by stating that we did not address the attention HSS has given to problems at the Office of River Protection. We specifically discussed the number of inspections at this site relative to other sites. We also discussed the number of enforcement actions and gave several examples. The point of our assessment was that this site has not received the inspections it should have based on HSS guidance and that the enforcement actions by HSS have not reduced the incidence of certain recurring violations of the nuclear safety requirements by contractors at this site.

DOE also asserts that the draft report fails to acknowledge the wide variation in the type and status of DOE's nuclear facilities and therefore incorrectly reports that there are significant gaps in HSS inspections of DOE nuclear sites. DOE further states that nuclear safety professionals would recognize that there are valid reasons why little value would be gained from inspecting certain sites, including sites where cleanup is essentially complete. Our draft report clearly noted in several places that there are a number of sites, including DOE's Fernald, Miamisburg/Mound, and Rocky Flats sites that have largely completed cleanup activities and have no remaining high-hazard nuclear facilities. Our discussion of inspection gaps was focused on those sites that have or had high-hazard nuclear facilities. While we agree that there may be valid reasons for concluding that inspecting certain sites would result in little value, it is important to note that HSS's own policy requires inspections every 2 to 4 years at high-hazard facilities. Of the 22 sites that had at least one high-hazard nuclear facility over the last 5 years, 8 were not inspected in the

required time frame. One site, Hanford's Office of River Protection, has received a site inspection only once since 1995, despite having four operating nuclear facilities. Even DOE's Rocky Flats site—which was undergoing cleanup activities at the time of the inspections—received three times as many reviews. If little value is gained from inspecting sites where cleanup is under way, we question why HSS reviewed that site three times as often as a site with operational nuclear facilities.

Finally, we disagree with DOE's comment that the draft report was developed by individuals with limited expertise in nuclear safety and with DOE's approach to nuclear safety. As our draft report noted, GAO began reporting on independent oversight within DOE in 1977. Over the ensuing years, we have produced dozens of reports examining nuclear safety and security issues at both DOE and NRC. Collectively, the GAO staff responsible for the draft report possess decades of experience examining DOE and NRC management of its programs, nuclear safety and security, and regulatory issues. The criteria we used to evaluate HSS are based on a long history of reviewing nuclear safety at DOE and supporting independent oversight and on discussions with outside nuclear safety experts.

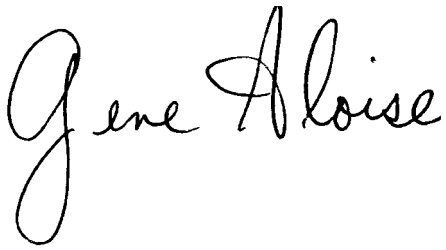
The Safety Board did not comment on our recommendations but wrote that the basic structure and authorities of the existing safety oversight organizations, including the board, provide a satisfactory framework for this function at those facilities under the board's jurisdiction. The Safety Board urged that the draft report be amended to emphasize that its statutory powers constitute action-forcing authority that is, in part, reflected by DOE accepting and acting upon all of the 50 recommendations that it has issued. However, as noted in appendix V, there has been a decline in the number of Safety Board recommendations over the years, some past deficiencies addressed by recommendations still remain unresolved, and the pace of closing out many other recommendations has been slow. This raises questions about DOE's responsiveness to the board's recommendations. Nevertheless, we revised the report to address the board's concerns and made other changes, as appropriate.

NRC did not comment on our recommendations but instead provided one general comment and other suggested changes to clarify the text related to our citing information from various reports, particularly the most recent report on its review of DOE regulatory processes at the Hanford Waste Treatment Plant. As a general comment, NRC wrote that the current commission has not expressed a view on expanding its oversight role

beyond the DOE facilities already subject to NRC regulation. We incorporated other suggested changes where appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the Secretary of Energy, the Chairman of the Defense Nuclear Facilities Safety Board, and the Chairman of NRC. We will make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staffs 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 members who made contributions to this report are listed in appendix IX.



Gene Aloise
Director, Natural Resources
and Environment

Appendix I: Objectives, Scope, and Methodology

In our review, we examined 1) the extent to which the Office of Health, Safety and Security (HSS) meets the elements of effective independent nuclear safety oversight and (2) the factors contributing to any identified shortcomings with respect to these five elements.

To conduct our review, we examined HSS's structure and functions and that of its predecessor offices—principally the former Office of Environment, Safety and Health and the Office of Safety and Security Performance Assurance—with respect to only meeting our elements of effective independent oversight of nuclear safety. We included in this review two HSS predecessor offices because HSS began operation in October 2006. We relied on criteria we developed in a 1987 report that reviewed legislation to establish the Defense Nuclear Facilities Safety Board (Safety Board), with the addition of enforcement authority, which was given to the Department of Energy (DOE) around the same time as the formation of the Safety Board. In some cases, we further defined these elements with recommendations from our past reports, HSS guidance, and through discussions with outside nuclear safety experts.

To examine the extent to which HSS, as currently structured, meets the elements of effective independent nuclear safety oversight, we assessed the oversight and enforcement practices of HSS and its predecessor offices against our criteria for (1) independence; (2) technical expertise; (3) ability to perform reviews and have findings effectively addressed; (4) enforcement; and (5) public access to facility information. To conduct this assessment, we reviewed relevant DOE rules and directives; met with headquarters program office managers and HSS officials to discuss current and past oversight practices; collected and analyzed information obtained from documents and interviews with these officials and at the Oak Ridge National Laboratory and Y-12 National Security Complex, as well as the Office of River Protection and the Richland Office at the Hanford Site; and reviewed the database of HSS environment, safety, and health program inspection reports and enforcement activities. We assessed data on contractor self-reported violations of the nuclear safety requirements entered into the Noncompliance Tracking System, which we determined were sufficiently reliable for the purposes of this report, and safety basis information from a GAO-administered Web-based survey.

Although DOE has the Safety Basis Information System (SBIS) database that tracks some information on the safety basis of nuclear facilities, we determined that the information included in this database was not sufficient for our analysis. To obtain reliable data, we developed a Web-based survey instrument to administer to DOE officials who are responsible for overseeing nuclear safety at hazard category 1, 2, and 3

nuclear facilities. The survey instrument included two parts. First, program office officials at the site were asked to provide details on the safety basis status for each nuclear facility for which they had oversight responsibility. Second, these officials were asked to respond to questions regarding guidance provided to them on safety basis information and the line of authority for approving the safety bases and any modifications to them.

To identify the current list of DOE's hazard category 1, 2, and 3 nuclear facilities for survey administration, we reviewed lists of nuclear facilities from each of the program offices and the National Nuclear Security Administration (NNSA) and e-mailed site officials to verify that the lists of nuclear facilities were accurate. Prior to administering the survey, we pretested the content and format of the survey with program officials at four sites to determine whether (1) the survey questions were clear, (2) the terms used were precise, (3) respondents were able to provide the information we were seeking, and (4) the questions were unbiased. We made changes to the content and format of the survey based on pretest results. The survey was designed as a Web-based survey with a unique username and passcode for each survey respondent. The survey was sent to 34 program officials that were collectively responsible for what we identified as the total number (205) of high-hazard nuclear facilities across the DOE complex. The survey field period was from mid-December 2007 to mid-February 2008 and the survey response rate was 100 percent.

To determine the factors contributing to any identified shortcomings with respect to the five elements of effective independent oversight of nuclear safety, we analyzed documentary and testimonial evidence on current HSS practices and those of the former Office of Environment, Safety and Health. In addition, we reviewed documents and interviewed officials from the Safety Board and the Nuclear Regulatory Commission (NRC) regarding past and current experiences in overseeing or planning to oversee DOE nuclear facilities. We also discussed with them their capability to accept an expanded role in overseeing DOE nuclear facilities. Furthermore, we asked for perspectives on DOE oversight of nuclear facilities from former DOE senior officials, academics, and representatives from organizations who are knowledgeable about nuclear safety and DOE operations, including the Health Physics Society, a nonprofit professional organization whose mission is to promote the practice of radiation safety; Conference on Radiation Control Program Directors, a nonprofit organization of individuals that regulate and control the use of radioactive material and radiation sources; and the Government Accountability Project, a government watchdog organization. We also spoke with a representative

from the Institute of Nuclear Power Operations about the functions of corporate safety offices in nuclear utility companies.

We conducted this performance audit from April 2007 through September 2008 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.

Appendix II: DOE Nuclear Safety Regulations and Related Directives

The following table presents the DOE nuclear safety directives, which include rules, guidance, and orders. We obtained this list from HSS, which cautioned that it is not all inclusive. The list of directives are most related to and developed specifically for DOE nuclear safety. Other directives, such as those specifically related to worker radiation protection, public and environmental radiation protection, and DOE general management are important but are not listed in the table. This list also does not include technical standards that DOE may recommend or require for complying with nuclear safety requirements. These and other DOE directives can be obtained from http://www.directives.doe.gov.

Table 4: DOE Nuclear Safety Regulations and Related Directives

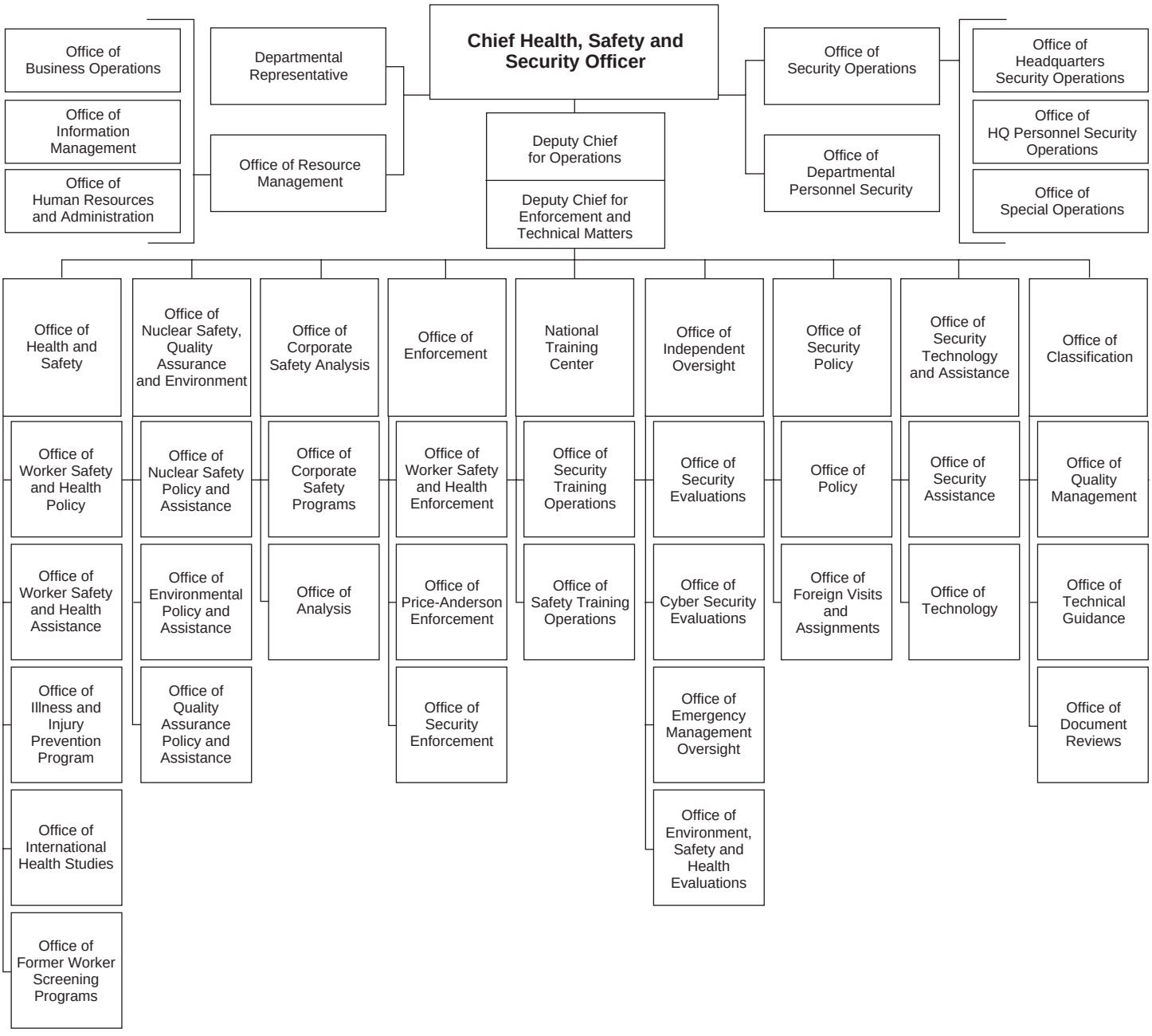
Number	Title
10 CFR	**DOE nuclear safety related rules**
Part 708	*DOE Contractor Employee Protection Program*
Part 820	*Procedural Rules for DOE Nuclear Activities*
Part 830	*Nuclear Safety Management*
Part 835	*Occupational Radiation Protection*
DOE[a]	**DOE directives supporting nuclear safety rules**
P 410.1	*Promulgating Nuclear Safety Requirements*
O 410.1	*Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*
G 414.2A	*Quality Assurance Management System Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance*
G 414.1-4	*Safety Software Guide for Use with 10 CFR 830, Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance*
G 414.1-5	*Corrective Action Program Guide*
O 414.1C	*Quality Assurance*
O 420.1B	*Facility Safety*
G 420.1-1	*Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for Use with DOE O 420.1 Facility Safety*
G 420.1-2	*Guide for the Mitigation of Natural Phenomena Hazards for DOE Nuclear Facilities and Non-Nuclear Facilities*
G 420.1-3	*Implementation Guide for Fire Protection and Emergency Services Program for Use with DOE O 420.1B*
G 421.1-1	*DOE Good Practices Guide Criticality Safety Good Practices Program Guide for DOE Nonreactor Nuclear Facilities*
G 421.1-1 Appendices	*DOE Good Practices Guide*
G 421.1-2	*Implementation Guide for Use in Developing Documented Safety Analysis to Meet Subpart B of 10 CFR 830*
G 423.1-1	*Implementation Guide for Use in Developing Technical Safety Requirements*
G 424.1-1A	*Implementation Guide for Use in Addressing Unreviewed Safety Questions Requirements*
O 425.1C	*Startup and Restart of Nuclear Facilities*

Number	Title
O 433.1	*Maintenance Management Program for DOE Nuclear Facilities*
G 433.1-1	*Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
P 442.1	*Differing Professional Opinions on Technical Issues Related to Environment, Safety, and Health*
M 442.1-1	*Differing Professional Opinions Manual for Technical Issues Involving Environment, Safety, and Health*
O 470.2B	*Independent Oversight and Performance Assurance Program*
O 5480.19	*Conduct of Operations Requirements for DOE Facilities*
O 5480.20A	*Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*
O 5480.30	*Nuclear Reactor Safety Design Criteria*
SEN 35-91	*Nuclear Safety Policy*

Source: DOE.

[a]In the directive numbers, G indicates DOE guidance, O indicates DOE Order, M indicates DOE manual, and P indicates DOE policy, and SEN indicates Secretary of Energy Notices. Policies contain DOE goals and objectives, orders and manuals contain requirements, and guidance documents provide nonmandatory means of meeting the requirements. DOE's program and site offices sometimes provide additional guidance for meeting the requirements.

Appendix III: HSS Organizational Chart



Source: Office of Health, Safety and Security.

Appendix IV: Aggregate Results from Survey of DOE High-Hazard Nuclear Facilities

This appendix provides the aggregate results from our survey of DOE's high-hazard nuclear facilities. The Web-based survey was comprised of two parts. The first part asked questions about the safety basis for each of the high-hazard nuclear facilities. Thirty-four respondents were asked to provide responses to these questions concerning DOE's 205 high-hazard nuclear facilities. The second part asked questions about the general review process undertaken by the program offices. Because some questions were not answered by all respondents, the totals for each question do not necessarily add to the total number of survey respondents.

Safety Basis Information at Nuclear Facilities

U.S. Government Accountability Office

Welcome to the Survey on Safety Basis Information at Nuclear Facilities. At the request of the Congress, the U.S. Government Accountability Office (GAO) is examining the effectiveness of the Department of Energy's (DOE) Office of Health, Safety and Security (HSS) in its independent oversight of nuclear safety at DOE facilities. As part of this review, we have prepared two surveys for DOE officials who oversee nuclear safety at sites that contain these facilities.

Questions on this survey include information on the safety basis status for hazard category 1, 2, or 3 nuclear facilities overseen by your site office.

Q2. What is the hazard category of [facility]?

Hazard category 1	Hazard category 2	Hazard category 3	Below hazard category 3	Other	Don't know	Number of respondents
2	152	45	0	6	0	205

Q3. What is the operational status of [facility]?

Not under construction	Under construction	Other	Don't know	Number of respondents
196	7	0	0	203

Q4. What is the current safety basis approval status of [facility] ?

Safety basis is approved under 10 CFR 830	Safety basis is pending approval under 10 CFR 830	Safety basis has not been updated to meet 10 CFR 830	Safety basis is under development	Other	Don't know	Number of respondents
170	0	21	10	3	0	204

Q5. If the safety basis is under development, does [facility] have an approved preliminary safety basis under 10 CFR 830?

Yes	No	Don't know	Number of respondents
7	3	0	10

Q7. Since January 2007, were there any Potential Inadequacies in the Safety Analysis (PISAs) identified for [facility]?

Yes	No	Don't know	Number of respondents
56	140	9	205

Q8. If yes, how many PISAs were identified?

Mean	Minimum	Maximum	Number of respondents
2	1	10	55

Q9. How many of these PISAs resulted in a positive USQ?

Mean	Minimum	Maximum	Number of respondents
2	1	6	40

Q10. Of the positive USQs that resulted from PISAs, how many resulted in Justifications for Continuing Operation (JCOs)?

Mean	Minimum	Maximum	Number of respondents
1	1	2	28

Q11 and Q12. Of the positive USQs that resulted from PISAs, how many are:

	Mean	Minimum	Maximum	Number of respondents
Q11a. Number that are currently unresolved	1	1	4	14
Q12a. Number resolved through revisions to the safety basis	2	1	4	10
Q12b. Number resolved through amendments to the safety basis	1	1	2	4
Q12c. Number resolved through permanent exemptions	.	.	.	0
Q12d. Number resolved through temporary exemptions	1	1	1	1
Q12e. Number resolved through other actions	4	2	5	2
Q12g. Number resolved through JCO	1	1	2	19

Q13. Is [facility] currently operating under a JCO?

Yes	No	Don't know	Number of respondents
67	136	2	205

Q14. If yes, how many JCOs are currently in place?

Mean	Minimum	Maximum	Number of respondents
1	1	3	67

Q15a. Difference between JCO approval date and JCO expected end date - in months

Mean	Minimum	Maximum	Number of respondents
30	3	113	50

Q15b. Length of time JCO has been in place from end of survey field period - in months

Mean	Minimum	Maximum	Number of respondents
11	1	58	75

Q16. Does [facility] currently have any approved exemptions under 10 CFR 830?

Yes	No	Don't know	Number of respondents
3	200	1	204

Q17a. If yes, how many of these exemptions are temporary exemptions?

Mean	Minimum	Maximum	Number of respondents
1	1	1	1

Q17b. If yes, how many of these exemptions are permanent exemptions:

Mean	Minimum	Maximum	Number of respondents
1	1	1	2

For the general survey, more than one respondent from a site office responded to our survey. In some cases, not all respondents from the same site office necessarily provided the same response to the questions. As a result, if at least one site office respondent responded yes to a question, we coded the response from that site office as yes. Aggregate results from the 16 site offices are presented below.[1]

[1]Results are provided for 16 site offices, rather than the 18 site offices that currently have high-hazard nuclear facilities, because one respondent filled out one survey for both Portsmouth and Paducah and the responses from the Hanford Site and the Hanford Office of River Protection are combined.

Review of DOE's Office of Health, Safety and Security (HSS)

U.S. Government Accountability Office

At the request of the Congress, the U.S. Government Accountability Office (GAO) is examining the effectiveness of the Department of Energy's (DOE) Office of Health, Safety and Security (HSS) in its independent oversight of nuclear safety at DOE facilities. As part of this review, we have prepared two surveys for DOE officials who oversee nuclear safety at sites that contain these facilities.

This survey includes a short set of general questions regarding safety basis guidance and approval authority.

Q1. Has your headquarters line management issued any guidance on safety basis requirements that is supplemental to the guidance issued by HSS?

Yes	No	Don't know	Number of respondents
12	4	0	16

Q2. Has your site office issued any guidance on safety basis requirements that is supplemental to the guidance issued by HSS?

Yes	No	Don't know	Number of respondents
7	9	0	16

Q3. Does your site office have the authority to approve initial safety basis requirements at hazard category 2 and 3 facilities?

Yes, for category 2 facilities only	Yes, for category 3 facilities only	Yes, for both category 2 and 3 facilities	No approval authority	Don't know	Number of respondents
1	2	8	5	0	16

Q4. Does your site office have the authority to approve changes to the safety basis (such as amendments, revisions, and JCOs) at hazard category 2 and 3 facilities?

Yes, for category 2 facilities only	Yes, for category 3 facilities only	Yes, for both category 2 and 3 facilities	No approval authority	Don't know	Number of respondents
1	0	10	5	0	16

Q5. Does your site office have the authority to downgrade facilities or activities to lower hazard categories?

Yes, can downgrade a category 2 facility to 3	Yes, can downgrade a category 3 facility to below 3	Yes, can downgrade both category 2 and 3 facilities	No approval authority	Don't know	Number of respondents
2	0	8	6	0	16

Q6. Have any nuclear facilities at your site office been downgraded from hazard category 3 to below 3 since January 2007?

Yes	No	Don't know	Number of respondents
6	10	0	16

Appendix V: Options for External Regulation of DOE Nuclear Facilities

Two prominent options for external regulation of DOE nuclear facilities have been put forward to improve the effective independent oversight of nuclear safety. Most DOE high-hazard nuclear facilities are already subject to external scrutiny by the Safety Board, and a few are currently externally regulated by NRC. One option would be to restructure and expand the role of the Safety Board. This option appears practical but has not been advocated for by the Safety Board. The second option is to shift all or some additional DOE nuclear facilities to external regulation by NRC. This option also appears practical and acceptable in the past if given the necessary authority and resources, but the current commission has not expressed a view on expanding its oversight role beyond the DOE facilities already subject to NRC regulation. DOE and the Safety Board have taken issue with this option because of concerns about the transition costs versus the likely safety benefits of doing so.

Most DOE High-Hazard Nuclear Facilities Subject to External Review, but Few Are Externally Regulated

Most DOE high-hazard nuclear facilities are already externally reviewed, but not regulated for nuclear safety, by the Safety Board, and a few are already externally regulated by NRC. The Safety Board was established in 1988 to provide independent safety oversight of DOE defense nuclear facilities. The Safety Board was given responsibilities to (1) review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities; (2) investigate any event or practice at these facilities that it determines has adversely affected or may adversely affect public health and safety; (3) analyze design and operational data, including safety analysis reports; (4) review new facility design and monitor construction, recommending any changes within a reasonable time period; and (5) make such recommendations to the Secretary of Energy, considering the technical and economic feasibility of implementing them. By statute, the Secretary must respond in writing to the Safety Board to accept or reject the recommendation and make this public. If the Safety Board transmits a recommendation relating to an imminent or severe threat, the Board shall also transmits it to the President and for information the Secretary of Defense. The President shall review DOE's response and accept or reject the Safety Board's recommendation. The Safety Board does not have the authority of a regulator but rather uses both informal interactions and formal communications with DOE to implement its statutory "action forcing" authorities.

The defense nuclear facilities overseen by the Safety Board constitute 74 or 76 high-hazard nuclear facilities within NNSA and 80 of 90 high-hazard nuclear facilities within the Office of Environmental Management. The Safety Board does not have a role in overseeing nondefense nuclear

facilities comprising 2 NNSA, 10 Office of Environmental Management, and 39 Office of Science and Office of Nuclear Energy high-hazard nuclear facilities. The 51 nondefense high-hazard nuclear facilities represent about 25 percent of the 205 such facilities across the DOE complex as of December 2007.

The Safety Board, technical staff, and site representatives informally interact with DOE officials at the sites and headquarters and with the contractors during this process. The 10 site representatives at five DOE sites provide day-to-day observations of nuclear operations at the sites and, among other responsibilities, record these observations in weekly reports to the Safety Board. The site representatives have no role in enforcing DOE's nuclear requirements, as this authority was never given to the Safety Board.

Outside of informal interactions, the Safety Board uses its authority to issue letters and recommendations to and impose reporting requirements on DOE, publish technical reports, and hold public hearings on safety issues. The Safety Board noted in its 2007 annual report to the Congress that since 1989, it has issued 48 formal recommendations—comprising 221 individual subrecommendations—184 reporting requirement letters, and held 94 public hearings.[1] The current number of recommendations is now 50. Starting around 1995, however, the number of Safety Board recommendations has declined from a range of five to seven per year since 1990 a range of zero to three per year through 2007. In September 2006, the Congress urged the Safety Board to evaluate whether more frequent use of recommendation letters would speed up resolution of issues with DOE.[2] The Congress was concerned about delays primarily resulting from the untimely resolution by DOE of technical issues raised by the Safety Board during the design of the waste treatment plant at the Hanford Site. The Safety Board subsequently responded that it could provide timely resolution of most health and safety concerns regarding the design and construction of new DOE nuclear facilities without the need for it to resort to formal recommendations.

[1]Defense Nuclear Facility Safety Board, *Seventeenth Annual Report to Congress* (Washington, D.C.: February 2007).

[2]Conference Report accompanying the John Warner National Defense Authorization Act for Fiscal Year 2007, H.R. Rep. No. 109-702, at 976 (2006).

While DOE has been responsive to the Safety Board's recommendations, a number of past deficiencies remain unresolved, and the pace of closure for many other recommendations has been slow. According to the Safety Board, DOE has accepted all of its recommendations. However, some concerns raised by the Safety Board in its first annual report to the Congress, in February 1991, have not been fully resolved. These include shortcomings in nuclear safety analysis; lack of valid justifications for continued operations, possibly causing temporary or permanent curtailment of operations; and deficiencies in technical capabilities to effectively manage, direct, and guide nuclear operations. While this report pointed out the formidable problem of ensuring that DOE effectively applies its own rules at the time, the Safety Board noted the intentions of the Secretary of Energy to establish within DOE a new safety culture for nuclear activities. The pace of closure for many recommendations has also been slow. It has taken DOE up to 11 years to obtain closure from the Safety Board for some of its recommendations. Some systemwide recommendations, such as the one addressing safety management, have remained open for a decade or more. Of the 19 recommendations since 1995, 10 remain open, along with 1 more from previous years going back to 1992.

DOE has sometimes struggled with the action-forcing nature of the recommendations from the Safety Board. Concerns about the authority of the Safety Board surfaced in a 1995 DOE Advisory Committee report,[3] which found that the board was not subject to the same checks and balances as NRC is with respect to regulating NRC's licensees. More recently, the chief of the technical staff to one of DOE's Central Technical Authorities told us that in addressing seismic safety issues, the Safety Board has essentially tried to regulate from what he characterized as its advisory role. In May 2006, the Secretary of Energy sent a memorandum to the department heads to clarify the distinction between program office responsibilities and the role of the Safety Board. The Secretary wrote that DOE views the Safety Board as a "valuable asset" in meeting its obligation to ensure the highest standard of nuclear safety through its advice and observations but that the program offices have the authority and accountability for nuclear safety. This memorandum did not mention the role of the independent oversight office, now HSS.

[3]DOE, *Improving the Regulation of Safety at DOE Nuclear Facilities.*

NRC is also involved in regulating some DOE nuclear facilities and has examined the possibility of regulating other facilities that had commercial application:

- In 1978, the Congress enacted the Uranium Mill Tailings Radiation Control Act, which established two programs to protect the public and the environment from uranium processing waste. This legislation required DOE's cleanup and remediation of these abandoned sites to be performed with the concurrence of NRC.

- NRC granted DOE's Idaho Operations Office a license in 1999 for the operation of an Independent Spent Fuel Storage Installation to store the spent fuel from Three Mile Island Unit 2 at the Idaho National Engineering and Environmental Laboratory.

- In 2003, NRC approved a license amendment to allow Nuclear Fuels Services, Inc., to possess and use Special Nuclear Material at its newly constructed uranyl nitrate building at its Tennessee complex. This facility and another one in Virginia, operated by another contractor, are not owned by DOE but work almost exclusively for DOE and the Department of Defense. These facilities are part of DOE's program to reduce stockpiles of surplus highly-enriched uranium through reuse or disposal as radioactive waste. The contractor has agreed to implement enhanced security measures recommended by NRC.

- The Congress gave NRC an important role in licensing the construction and overseeing the eventual operation of two new DOE nuclear facilities; the geologic repository for high-level waste at the Yucca Mountain Site in Nevada for which DOE is the licensee and the Mixed Oxide Fuel Fabrication Facility at DOE's Savannah River Site in South Carolina for which the contractor would be the licensee, if the application is approved.

NRC has also been involved in reviewing the development of some DOE nuclear facilities that had potential commercial application. In the late 1970s, NRC got involved in reviewing DOE's Fast Flux Test Reactor at the Hanford Site, which was to test advanced nuclear fuels, materials, components, systems, nuclear power plant operating and maintenance procedures, and active and passive reactor safety technologies that could have commercial application. Later, NRC got involved in evaluating more advanced design concepts, conducting preliminary licensing reviews, and preparing safety evaluation reports. However, DOE decided to deactivate this reactor in 2001 without going to commercialization. Starting in 1997, NRC also worked with DOE on the planned Hanford Waste Treatment Plant, then known as the Tank Waste Remediation System-Privatization Program.

NRC provided assistance to DOE for over 3.5 years under a Memorandum of Understanding. The memorandum gave NRC the opportunity to acquire an understanding of the wastes and potential treatment processes, and allowed DOE to see how NRC would perform reviews and develop an effective regulatory program for the potential transition to its regulatory oversight. In the course of its work with DOE, NRC staff reported that they gained an understanding of the waste and treatment issues and found that, for the most part, standard nuclear industry methods could be used for risk reduction.[4] However, NRC reported that it had identified over two dozen significant issues and over 50 specific topic areas in the design and approval approach DOE was considering that would require further efforts and analysis under the NRC approach. For example, NRC identified the influence that cost, schedule, and capacity were having on the review activities, as well as inconsistencies between the design and updates to the authorization basis in which DOE grants the contractor permission to perform certain operations. A senior DOE official that had been with a regulatory unit that was reviewing the design for the Waste Treatment Plant told us that this unit had also identified similar issues with the process. DOE eventually decided in May 2000 to abandon the privatization of this facility, citing, among other reasons, the high cost of privatization and declared its intent to pursue a more conventional DOE self-regulatory approach without any schedule for transitioning to NRC regulatory oversight. Most recently, NRC issued a report on its review of DOE regulatory processes for this plant.[5]

Option to Expand Role of Safety Board Appears Practical, but Not Advocated

While restructuring and expanding the responsibilities of the Safety Board appears practical, the Safety Board has not advocated for this change in the past. The board could be given authority to oversee all DOE high-hazard nuclear facilities, approve the safety basis for designing and constructing any new facility, approve significant modifications to the safety basis of existing facilities, and enforce DOE nuclear safety requirements. The Safety Board already has on-site representatives at many DOE sites, and it is familiar with DOE's nuclear safety requirements and oversight approach. Its safety reviews of the design and construction of new nuclear facilities are extensive, and it is equally accustomed to

[4]Nuclear Regulatory Commission, *Overview and Summary of NRC Involvement with DOE in the Tank Waste Remediation System-Privatization Program*, NUREG-1747 (Washington, D.C., August 2001).

[5]Nuclear Regulatory Commission, *Review of the U.S. Department of Energy's Regulatory Processes for the Hanford Waste Treatment Plant* (Washington, D.C., August 2008).

considering the requirements of nuclear safety and national security, as well as the safety risks, mission priorities, and costs in its recommendations. In addition, the Safety Board has experienced scientific and technical personnel, and the power to hire more such personnel without having to go through the civil service system. Moreover, the Safety Board's legislation authorizes a staff of up to 150 but, according to the board, the Congress has limited the amount of authorized and appropriated funds such that the board has about 100 full-time employees, of which less than 60 are technical staff.

The Safety Board, however, has not advocated for changing its authorities and responsibilities. For example, in a July 2007 report to the Congress,[6] the Safety Board and DOE concluded that rigorous adherence to the existing responsibilities and powers set forth in present law would foster the early identification and resolution of safety issues without the need for legislative changes. Their report pointed out that during the past 2 years, the Safety Board and DOE had established several new expectations and requirements and were committed to continuous improvement of DOE's project management directives. More recently, the Safety Board told us that it currently lacks the resources to take on more responsibilities, particularly for enforcement activities. In commenting on draft of this report, the Safety Board stated that even if it was directed to conduct a full suite of compliance activities comparable to those of the NRC licensing activities, significantly more resources than the summation of current staff plus HSS enforcement staff would be required. In regard to increasing site representation, we were informed that if the current DOE facility representatives were transferred to the Safety Board as independent inspectors, this would take away resources that the program offices would need to replenish to continue their current level of contractor oversight. The Safety Board also raised concerns in its fiscal year 2008 budget request about its own ability to recruit qualified engineers, in part because a renewed interest in commercial nuclear power has created competition for these specialists. Nevertheless, officials stated that the Safety Board would of course accept more responsibilities for regulating DOE nuclear facilities, as long as it has adequate funding, staffing, and legislative authority. However, in responding to a draft of this report, the Safety Board stated that the basic structure and authorities of the existing safety oversight organizations, including the board, provide a satisfactory framework for this function at those facilities under its jurisdiction.

[6]Defense Nuclear Facilities Safety Board and Department of Energy, *Improving the Identification and Resolution of Safety Issues during the Design and Construction of DOE Defense Nuclear Facilities* (Washington, D.C., July 2007).

Option to Shift Regulation to NRC Appears Practical and Acceptable, but Costs and Benefits Have Been Challenged

NRC's experiences regulating and examining how it would regulate many DOE nuclear facilities indicate that shifting DOE nuclear facilities to its regulatory oversight appears practical, even though the costs and benefits have been questioned. As previously stated, NRC is currently involved in regulating a number of DOE nuclear facilities in construction or operation, as well as many uranium mill sites. NRC has also evaluated its capabilities and the potential costs of regulating additional DOE nuclear facilities. Beginning in October 1997, NRC tested regulatory concepts through simulated regulation of three DOE sites with nuclear facilities by evaluating each pilot facility against the standards that NRC believed would be appropriate for this type of facility.[7] In a July 1999 report,[8] NRC found that most of the technical, policy, and regulatory issues involving NRC oversight of these sites could be handled adequately within the existing NRC regulatory structure. In February 2003, the conference report accompanying the Consolidated Appropriations Resolution, 2003 directed that NRC carry out compliance audits of 10 DOE Office of Science sites in order for DOE to develop estimates of the costs necessary to bring the sites into compliance with NRC safety standards should the Congress direct NRC to assume regulatory responsibilities over these sites. In an April 2004 report,[9] NRC again concluded that activities involving radiation-producing materials and machines at these DOE sites could be effectively regulated within the existing NRC regulatory structure.

While NRC has not advocated for taking on regulation of DOE nuclear sites, it has identified some benefits in doing so. For example, in its 1999 report on external regulation of DOE nuclear facilities, NRC stated that its regulation would eliminate the inherent conflicts of interest arising in DOE self-regulation, leading to a safety culture comparable to the safety culture in the commercial industry, and allow the department to focus on its primary missions. However, in this report, NRC also stated that it would need adequate funding, staffing, and legislative authorization, as well as the opportunity to update its regulations as necessary. Other prominent

[7]The DOE sites were Lawrence Berkeley National Laboratory, the Oak Ridge National Laboratory Radiochemical Engineering Development Center, and the Savannah River Site Receiving Basis for Offsite Fuels.

[8]Nuclear Regulatory Commission, *External Regulation of Department of Energy Nuclear Facilities: A Pilot Program*, NUREG 1708 (Washington, D.C., July 1999).

[9]Nuclear Regulatory Commission, *Findings of the Compliance Audits of Department of Energy Science Laboratories by the United States Nuclear Regulatory Commission*, SECY-04-0062 (Washington, D.C., Apr. 13, 2004).

stakeholder organizations have recently come forward with recommendations that the Congress consider shifting DOE to external regulation by NRC. These groups include the Health Physics Society, a nonprofit professional organization representing about 6,000 members whose mission is to promote the practice of radiation safety; the Conference on Radiation Control Program Directors, a nonprofit organization of individuals that regulate and control the use of radioactive material and radiation sources; the Government Accountability Project, a government watchdog organization; and the American Federation of Labor and Congress of Industrial Organizations. For example, the Health Physics Society informed us in an August 21, 2007, correspondence that self-regulation of nuclear safety by DOE is in contrast to the fundamental principle that a single, independent agency should have the authority to establish and enforce national standards for radiation safety. Moreover, the letter pointed out that reliance on national security concerns to justify continued self-regulation by DOE may no longer be compelling in light of the increased security environment under which NRC now operates. The Conference on Radiation Control Program Directors also provided us with a Board of Directors Resolution, dated August 7, 2007, that the Atomic Energy Act be amended to provide for the regulation of DOE by the NRC for materials authorized under the Act.

The principal concerns with shifting DOE to external regulation of nuclear safety by NRC have been the transition costs versus the potential safety benefits that would emanate from eliminating self-regulation. DOE and NRC have differed on the cost and potential benefits of shifting to external regulation. DOE expressed concerns that transition costs would exceed any value in shifting to external regulation because of facility-specific issues, potential uncertainties and implications of NRC regulatory requirements, and the regulatory difficulty of licensing a single facility on a large and complex nuclear site.[10] For example, DOE estimated the transition cost for NRC regulations of the Receiving Basin for Offsite Fuels Facility at the Savannah River Site to be between $6 million and $13.5 million, with annual costs thereafter estimated at $1.5 million to $3.2 million (in 1999 dollars). However, NRC countered that because few changes to DOE facilities or procedures would be needed under NRC regulation, the transition costs would be far less than estimated by DOE. NRC noted that DOE costs could be minimized and that the change might provide a net savings if DOE reduced the level of its oversight to one

[10]DOE, *Report on the Pilot Project on External Regulation of DOE Facilities at Receiving Basin for Offsite Fuels Facility, Savannah River Site* (Washington, D.C., April 1999).

commensurate with a corporate oversight model. Nevertheless, NRC would have to increase its staffing levels to regulate DOE nuclear facilities, but at an uncertain number. A DOE working group on external regulation estimated in 1996 that NRC would need 1,000 to 1,600 new employees at a cost of $15 million to $200 million.

The Safety Board has sided with DOE in questioning the cost and benefits of external regulation by NRC, early on raising national security concerns with external regulation. The National Defense Authorization Act for Fiscal Year 1998 required the Safety Board to make recommendations to the Congress on what role it should take in the event that the Congress should consider legislation for externally regulating DOE defense nuclear facilities. In its November 1998 report, the Safety Board rejected a shift to external regulation of DOE defense nuclear facilities for several reasons, including the potential adverse effects on national security and the likelihood that costs would outweigh any benefits that might accrue.[11] Based on its review of factors that would attend to external regulation of these nuclear facilities, the Safety Board stated that it does not believe that additional external regulation of them is in the best interest of our nation. The board further stated that the Congress made the right decision in setting it up as an independent advisory agency, not a regulator, and that the contributions of the Safety Board since its inception attests to the efficiency of its structure.

More recently, HSS officials told us that NRC's regulatory structure and approach may not fit DOE's operational model because of important differences from the commercial nuclear industry, such as having one-of-a-kind facilities. HSS contends that it has coordinated with and evaluated DOE's initiative to strengthen program office oversight and that integrating these procedures into the fabric of the department's way of doing business offers a viable alternative model to external regulation by an agency that is not familiar with the intricacies of the unique operations found at DOE facilities. In addition, HSS points out that external regulation is not a panacea solution and that there are oversight failures, such as NRC's experience with the Davis Besse nuclear power plant.[12] HSS

[11]Defense Nuclear Facilities Safety Board, *Report to Congress on the Role of the Defense Nuclear Facilities Safety Board Regarding Regulation of DOE's Defense Nuclear Facilities* (Washington, D.C., November 1998).

[12]On April 21, 2005, NRC issued a Notice of Violation and Proposed Imposition of Civil Penalties in the amount of over $5 million to the Davis Besse nuclear power plant licensee for multiple violations related to the significant degradation of the reactor pressure vessel head. A portion of the fine was levied because the licensee failed to provide complete and accurate information to NRC.

also points out the steady improvement in measurable safety areas across the DOE complex and contends that an objective assessment of DOE's safety performance contradicts the assertion that the department's safety is lax or that it has pervasive problems and needs to be externally regulated.

Appendix VI: Comments from the Department of Energy

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

The Deputy Secretary of Energy
Washington, DC 20585

September 10, 2008

Mr. Gene L. Dodaro
Acting Comptroller General of the
United States
Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Dodaro:

The U.S. Department of Energy (DOE) has reviewed the Government Accountability Office (GAO) draft report entitled *Nuclear Safety: Department of Energy Needs to Strengthen Its Independent Oversight of Nuclear Facilities and Operations*, GAO-08-894, which was provided to the Secretary of Energy on August 22, 2008. I am responding on behalf of the Secretary. We have made enhanced safety a top priority at the Department and take this matter very seriously. In fact, it is one of the reasons the Department created the Office of Health, Safety and Security (HSS) two years ago.

We believe that the GAO draft report is fundamentally flawed; we disagree with many of the conclusions and feel that some of the recommendations are counterproductive to our common goal of continuing to improve nuclear safety at DOE sites. This letter summarizes our key points. Detailed comments are attached.

We have strong concerns about the scope and premise of the GAO evaluation. For example, GAO evaluated HSS's responsibilities in isolation rather than as one element of DOE's approach to nuclear safety. In so doing, GAO failed to address the critical role of DOE program and site offices in ensuring nuclear safety at DOE. The GAO draft report appears to be predicated on the erroneous premise that DOE program management is inherently ineffective and that all DOE oversight must be performed by HSS. This premise is contrary to one of the fundamental principles of integrated safety management: that line management must be responsible and accountable for safety. By focusing solely on HSS, GAO is not properly considering the important fact that DOE has established more extensive and more effective programs to oversee nuclear safety, including the Facility Representative and Safety System Oversight programs, which are managed by DOE program and site offices and that provide DOE with a continuous onsite presence with nuclear safety responsibilities. The HSS independent oversight program effectively complements the DOE line management programs and provides assurance that the DOE line management programs are effective.

We believe that two of the GAO recommendations are counterproductive to continued improvements in nuclear safety. In one case, GAO recommends that HSS reestablish an onsite presence similar to the former Site Representative program. This approach has been tried in the past and, based on actual operating experience and lessons learned, was replaced by the more extensive Facility Representative and Safety System Oversight programs, which more effectively fulfill the DOE need for onsite nuclear safety oversight.

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In the other case, GAO recommends that HSS be given a significant role in the approval of the safety basis for DOE sites. Based on our experience, we believe that the current DOE approach (which utilizes line management in DOE programs and sites) has proven to be much more effective and has resulted in major improvements in safety. For example, over the past 15 years, DOE has dramatically improved safety through a multi-pronged approach that includes issuance of nuclear safety regulations, establishment of an enforcement program, establishment of systems engineer and safety system oversight programs, strengthening the Facility Representative program, and increased independent oversight of nuclear safety systems. As a result, all sites now have an approved safety basis and most have already been upgraded to the more rigorous standards defined in current regulations.

There are a number of aspects of the GAO draft report that raise questions about the credibility of the evaluation, and whether GAO staff approached this report with an open mind.

First, the GAO report appears to reflect a preconceived conclusion that HSS is not effective, and it seeks to validate that conclusion through flawed recommendations such as that HSS should have a Site Representative program, should review and approve safety basis documents, and should be led by a political appointee approved by the Senate. Throughout the report, we believe that GAO has selectively presented isolated information to support preconceived views and has ignored a substantial body of evidence to the contrary. The leadership provided by the Director of HSS, who is a career professional, is an important factor in the sustained improvement that DOE has experienced.

Second, in a number of critical areas in the draft report, GAO selectively quotes information from U.S. Nuclear Regulatory Commission (NRC) reports and Defense Nuclear Facilities Safety Board (DNFSB) letters out of context. For example, GAO cites an NRC report that identifies a specific concern with the effectiveness of DOE line management oversight as "evidence" of an HSS shortcoming. However, GAO then omits the overall conclusion of the NRC report which states that "NRC believes that the DOE program, if properly implemented, is adequate to ensure protection of public health and safety. Therefore, the NRC makes no specific recommendations within the scope of this review."

Third, the summary information provided on the cover sheet and in the "results in brief" section does not provide a balanced summary of the report and thus presents a misleading picture of DOE performance. As one example, the "results in brief" section indicates that DOE has made management decisions, such as eliminating the Site Representative program and revising the role of HSS in the approval of safety bases that result in "shortcomings" in HSS oversight. However, the "results in brief" section does not mention that these decisions were made at least ten years ago, well before the HSS office was created, and that these decisions were made in the context of other DOE actions that dramatically strengthened the overall DOE governance model (e.g., the multi-pronged approach described above).

Fourth, GAO draws erroneous conclusions based on an incomplete understanding of HSS's mission. GAO does not acknowledge that HSS has an array of safety missions to include independent oversight, enforcement, accident investigations and special reviews which are

employed at the DOE sites. For example, recently at the Office of River Protection (ORP) and the Hanford Site tank farms, HSS devoted resources in performing a number of enforcement actions, accident investigations, safety inspections, and special reviews. Consequently GAO incorrectly concludes that HSS has not focused attention on instances of poor safety performance at this site.

Finally, the report appears to have been developed by individuals who have limited expertise in nuclear safety and minimal experience with DOE's approach to nuclear safety. The quality of the GAO draft report suffers because GAO oversimplified or did not demonstrate a full and accurate understanding of complex and often unique nuclear safety issues that exist at DOE sites. For example, GAO's report fails to acknowledge an understanding of the wide variation in the type and status of DOE's nuclear facilities and therefore incorrectly reports that there are significant gaps in HSS inspections of DOE nuclear sites. Nuclear safety professionals would recognize that there are good and valid reasons why little value would be gained from inspecting certain sites (such as the Mound site in Ohio where cleanup is essentially complete) that GAO incorrectly characterizes as "gaps" in the HSS inspection schedule.

Although DOE disagrees with many aspects of the GAO draft report, we recognize that there are aspects of nuclear safety that need improvement. We understand that HSS, as well as DOE as a whole, must continue to focus on maintaining our technical expertise in nuclear safety and on filling vacancies in certain areas. We also agree that improvements are needed in the use of justifications for continued operations, and we are working to make these changes. Further, we agree that increased public availability of Independent Oversight reports is beneficial and have recently completed actions to make many safety oversight reports available on the Internet.

The Department of Energy has a strong nuclear safety record. But we are always looking for ways to strengthen our nuclear safety program. We are continuing to make improvements and believe that we are taking the right actions to achieve them. It is disappointing that the draft report, relying on faulty premises, fails to recognize the nuclear safety advancements that DOE has made.

Thank you for the opportunity to provide our views on the draft GAO report.

Sincerely,

Jeffrey F. Kupfer

cc: Mr. Gene Aloise

Enclosure

Enclosure

DOE Response to

GAO-08-894, GAO Draft Report Entitled
Nuclear Safety: Department of Energy Needs to Strengthen Its Independent Oversight of Nuclear Facilities and Operations

Purpose

This document provides U.S. Department of Energy (DOE) comments on the subject draft report. These comments were developed largely by the Office of Health, Safety and Security (HSS) but include input from DOE program offices and represent the position of DOE senior management.

Overview

DOE comments are provided in the following areas:

- General Comments
- Comments on DOE Independent Oversight Inspections
- Comments on Safety Basis
- Comments on Enforcement
- Comments on the Government Accountability Office (GAO) Recommendations to DOE
- Miscellaneous Factual Accuracy Comments

General Comments

1. **GAO's evaluation is fundamentally flawed because it evaluates HSS in isolation rather than as one element of the overall DOE governance model.**

See comment 1.

The GAO results are not valid because GAO evaluated the HSS role in isolation rather than as one element of the overall DOE governance model, which also includes the critical role of DOE line management (i.e., program offices and site offices). Essentially, the entire GAO draft report is predicated on the unsupported and invalid premise that DOE line management (program office and site office) oversight is inherently ineffective and that all DOE oversight must be performed by HSS. We strongly dispute this GAO premise and believe that the GAO premise is contrary to one of the fundamental integrated safety management (ISM) principles (i.e., that line management must be responsible and accountable for safety). Further, the GAO report virtually ignores the establishment of new capabilities within DOE line management, such as establishing the Central Technical Authority (CTA) functions and the Chief, Defense Nuclear Safety (CDNS) position within the National Nuclear Security Administration (NNSA); and Chief, Nuclear Safety (CNS) position for other DOE sites. These new functions and positions are an essential element of the DOE nuclear safety governance model and have been established in response to a Defense Nuclear Facilities Safety Board (DNFSB) recommendation. The CNS and CDNS provide nuclear safety oversight and advice to DOE sites and to the CTAs who oversee the line managers under their purview. The CNS and CDNS have been established to ensure the availability of technical expertise and provide operational awareness necessary for the proper implementation of nuclear safety by line management. For example, the CNS and its staff support the Under Secretary of Energy and the Under Secretary for Science in carrying out their functions as CTAs, including maintaining awareness of complex, high-hazard nuclear operations of sites. CNS and CDNS staffs monitor reports and performance metrics, review site-specific and DOE complex-wide technical and safety documents,

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and conduct site visits. They also maintain an operational awareness that includes safety basis implementation, nuclear facility startups, personnel training and qualifications, maintenance programs, criticality safety, conduct of operations, and radiation protection. For example, within NNSA, the CDNS performs a comprehensive review of the implementation of nuclear safety requirements at each of its sites on a nominal two year cycle; these reviews complement those of HSS and have resulted in numerous improvements in nuclear safety.

This fundamental flaw in the GAO evaluation approach leads to a number of invalid conclusions in the GAO draft report:

See comment 2.

- Looking solely at HSS, GAO notes that HSS does not have a continuous onsite presence (such as the Site Representative program, which was discontinued around 1999), concludes that HSS cannot perform day-to-day oversight of nuclear safety, and recommends that DOE establish a new and expensive program to maintain an HSS site presence. As the primary basis for this recommendation, GAO notes that, at one point, an HSS predecessor office had 32 onsite representatives (although not all of these focused on nuclear safety). For reasons that are not stated in the report, GAO appears to discount DOE and HSS perspectives that this program did not work very well and resulted in conflicting direction to DOE contractors that degraded the principle of line management responsibility for safety and the essential element of contractor accountability for nuclear safety. By focusing solely on HSS, GAO does not properly consider the important fact that DOE line management has established more extensive and more effective DOE-wide Facility Representative programs that provide DOE with a continuous onsite presence. These safety subject matter experts report directly to the DOE Site Manager and are dedicated to safety oversight, and HSS oversees the program. There are currently over 180 Facility Representatives, which is over five times as many onsite personnel as DOE had at the peak of the Site Representative program. DOE also established an extensive Safety System Oversight program at DOE site offices to specifically focus on nuclear safety systems. This program also has more resources devoted specifically to providing an onsite review of nuclear safety systems than the Site Representative program ever had. As one example, the Savannah River Site has about 30 Facility Representatives and 15 Safety System Oversight Engineers, which provides a far greater onsite presence for DOE than DOE had during period where it had, a few Site Representatives at each site. The assessment oversight program mandated by DOE Order 226.1A, *Implementation of Department of Energy Oversight Policy*, provide opportunities to use the greater number of staff, such as Facility Representatives and Safety System Oversight engineers, to perform more in-depth reviews of functional areas than would be possible by more infrequent assessments by an independent organization such as HSS. Also, DOE site offices have increased their focus on and resources devoted to the review of safety basis submittals, as part of an overall DOE initiative to address the severe problems with safety bases that were evident in the 1990s. In the enforcement arena, DOE has established site office enforcement coordinators, which provides DOE line management and HSS with another source of continuous onsite presence supporting nuclear safety. DOE has clearly taken actions to substantially strengthen its onsite presence at nuclear facilities and its ability to provide day-to-day oversight of nuclear safety. However, because of its fundamentally flawed approach, GAO arrives at an opposite and invalid conclusion.

See comment 3.

- Looking solely at HSS, GAO concludes that "HSS's ability to independently review nuclear facilities is limited because it has no role in approving the "safety basis"—a technical analysis that helps ensure safe design and operation of these facilities." While HSS does not approve safety bases, this is an intentional part of the DOE governance model and is not a valid example of a shortcoming in HSS's implementation of its mission. The GAO conclusion is based on the incorrect premise that DOE line management cannot perform an adequate review of a contractor submittal of safety basis documents. In fact, experience has shown that DOE line management personnel at DOE site offices,

overall, perform a more effective review of safety basis documents than Headquarters personnel, in part because of the diversity of nuclear facilities. Unlike other organizations that have similar numbers of nuclear facilities (e.g., naval reactors), each of the Department's nuclear facilities is unique. Thus, it is more effective to have site office personnel, who have a detailed understanding of the facilities and technical issues, performing the reviews than Headquarters personnel who do not. In addition, a credible process for approval of a safety basis requires is not simply a paperwork exercise; it requires the reviewer to know details about the facility and its hazards and hazard controls; such information is best obtained from numerous walkdowns of the facility and its safety systems, which is most readily performed by field personnel. Having HSS perform a safety basis review, in addition to the one performed by the site office, would require a substantial increase in resources without a commensurate increase in nuclear safety. Further, there is a concern that HSS would not be fully independent in its independent oversight role of reviewing site safety bases if it were involved in the approval process because HSS would then be reviewing its own work. Past involvement in the approval of safety basis documents by Headquarters personnel often resulted in conflicting and ill-conceived direction. The current DOE approach (where the most knowledgeable personnel have primary responsibility for safety basis approval) is demonstrably much more effective than the approach that GAO is advocating, which has been tried in the past and was replaced by more effective and extensive approaches.

2. GAO's evaluation is fundamentally flawed because it is predicated on an invalid assumption about an inherent DOE line management conflict of interest.

See comment 4.

GAO's rationale for its results and conclusions is its premise that current DOE approaches in critical areas (e.g., review and approval of safety basis and onsite presence) are not valid because DOE line management has an inherent conflict of interest and is not "fully insulated from potential conflicts of interest." DOE fully agrees that strong independent oversight is important and believes that the HSS program provides strong independent oversight that is well focused and appropriately reviews nuclear safety using a risk-based approach. DOE also agrees that program offices have multiple roles and thus can face potentially competing priorities. However, the principle of line management responsibility and accountability for safety are equally important to consider. The DOE governance model is carefully constructed to address the potential for conflicts of interest by ensuring that DOE line management at all levels (from the program offices to the subject matter expert at the site office) is subject to independent oversight reviews. Essentially, the entire GAO report is predicated on the unsupported and invalid assertion that program office oversight is inherently ineffective and that all oversight must be performed by HSS. DOE strongly disputes GAO's premise and believes that the GAO premise is not consistent with the fundamental principles of safety management, which include line management responsibility and accountability for safety. The first "Guiding Principle" in DOE's *Integrated Safety Management Manual* (DOE Manual 450.4) establishes "line management responsibility for safety."

See comment 5.

Further, the potential for conflicts of interest between mission objectives and safety will always exist in DOE and other industries that deal with hazardous materials. The key is to manage the potential conflict properly, which includes an appropriate system of checks and balances. DOE has an appropriate system where DOE line management oversees the contractor's priorities to ensure they are balanced, in accordance with ISM principles. Within line management, the CTA functions and CDNS and CNS positions were established specifically so that DOE line management has an element at the highest levels of the organization, reporting separately and independently to the CTA (and not lower tiers of line management) that has a sole focus on being the advocate for nuclear safety. HSS also provides an independent check on both DOE line management and the contractor to ensure that safety is provided appropriate priority and is effective in meeting regulations and DOE requirements.

See comment 6.

In several areas, GAO misrepresents the DOE position with respect to nuclear safety in a misleading manner. For example, on page 40 in the overall conclusion of the GAO report, GAO states "The current Secretary of Energy has decided to make HSS an office that provides the program offices with the assistance and tools necessary to solve problems and to improve performance so that DOE sites can better accomplish the department's missions and strategic goals. However, in our opinion, DOE needs a stronger independent oversight office to be the internal regulator of nuclear safety in order to offset the conflicts of interest that are inherent with routine oversight by the program offices." This statement is a misrepresentation of the Secretary of Energy's decision and incorrectly implies that DOE made a choice between assistance/problem solving/performance improvement and strong independent oversight. DOE made decisions that accomplish both performance improvement and oversight/enforcement and were specifically designed to strengthen HSS independent oversight and enforcement in several ways. For example, the safety organization no longer has to perform non-safety functions (e.g., managing facilities) that were distracting management attention from the more critical functions of oversight and enforcement. DOE strongly disputes any GAO inference that DOE made decisions that reduce the effectiveness of oversight or enforcement functions at the DOE Headquarters level, as implemented by HSS.

3. GAO's evaluation is fundamentally flawed because it is evaluating HSS against GAO's preconceived opinion of functions that should be assigned to HSS rather than HSS's actual role in the DOE governance model.

See comment 7.

GAO either does not understand or does not accept that there can be more than one effective governance model for nuclear safety. Throughout the report, GAO is advocating for and evaluating HSS against GAO's preconceived management model (i.e., an independent safety organization with certain corporate responsibilities, such as approval of safety bases). However, other management models can also be effective, such as the model that DOE uses which is premised on ensuring that line management has primary responsibility and accountability for safety, complemented by selective and prioritized independent oversight and enforcement. In essence, GAO is evaluating HSS and DOE against GAO's perspective of how GAO believes that DOE should be managed rather than evaluating the effectiveness of DOE's current management approach. As a result of its unjustified bias toward a particular management model, GAO is incorrectly characterizing DOE's conscious management decisions as "shortcomings" in the HSS mission and is drawing conclusions and making recommendations without a sound technical basis in the areas of onsite presence and safety basis reviews. As discussed above, GAO's unjustified premise that the onsite presence should report to HSS has caused GAO to discount DOE's ongoing and generally effective Facility Representative program and recommend creation of a largely duplicative Site Representative program. In the area of safety basis, GAO's unjustified bias toward a Headquarters corporate role in approval of safety bases has resulted in an ill-conceived recommendation for DOE to return to practices that have failed in the past. Rather than attempting to evaluate how well DOE manages its nuclear safety functions, GAO chose to evaluate HSS against its preconceived notion of how GAO believes DOE should have assigned nuclear safety responsibilities. As a result, the GAO report did not ask the right questions (e.g., Is the management model that DOE has chosen an effective approach to achieving and maintaining nuclear safety? Is it being effectively implemented? Has it resulted in improvements?), and, therefore, did not develop valid and useful data, conclusions, and recommendations.

4. GAO's evaluation is fundamentally flawed because it does not evaluate HSS performance with sufficient depth and breadth to support the report's conclusions.

See comment 8.

The GAO evaluation methods are too narrow in scope to provide a valid evaluation of HSS performance. GAO did not review a sufficient scope of activities or gather sufficient data to perform a valid evaluation of HSS performance in the areas of independent oversight appraisals and enforcement. In the area of independent oversight, HSS's Office of Environment, Safety and Health Evaluations (HS-64) performs

appraisals that examine important elements of nuclear safety and that have resulted in numerous improvements in nuclear safety programs across the complex. This is one of HSSs most important programs, and we believe that a credible review of HSS effectiveness should include a thorough review of the HSS appraisals. However, the GAO review of this critical program was very narrow and was limited to a review of the frequency of inspections (and, as discussed elsewhere in this response, GAO's conclusions about the inspection frequencies are not fully valid). GAO did not evaluate the more important aspects of the environment, safety, and health (ES&H) appraisal process, such as the scope of HSS appraisals, the quality of the inspections, the depth of the reviews, the technical expertise of the inspectors, the validity of the findings, and other such factors. In the area of enforcement, GAO's scope is similarly too narrow to provide for a valid assessment. It consists of a questionable review of reporting trends in a narrowly defined area that is not sufficient to provide valid perspectives on the effectiveness of the HSS enforcement program. In the area of technical expertise, GAO only looked at the number of vacancies and provided no perspectives on the actual technical expertise of HSS in the area of nuclear safety. The GAO report indicates that it provides an evaluation of HSS performance relative to HSS's five criteria that is sufficient to meet government audit standards and to provide a reasonable basis for findings and conclusions. For the most part, we disagree. As indicated here and elsewhere in this response, GAO fails to make its case that HSS lacks the independence, technical expertise, ability to perform reviews and require that findings be addressed, and the enforcement authority to do its job in a credible manner. However, with respect to access to independent oversight reports, as noted elsewhere in this response, improvements can and are being made.

5. GAO's evaluation misrepresents the results of the U.S. Nuclear Regulatory Commission (NRC) and DNFSB reports.

In several critical areas in the draft report, GAO selectively quotes information from NRC reports and DNFSB letters out of context and uses those quotes as "evidence" to support a perceived HSS shortcoming. Some of these include:

See comment 9.

- On page 2, GAO selectively cites an NRC report that identifies a specific concern with the effectiveness of DOE line management oversight as "evidence" of an HSS shortcoming. However, GAO omits the overall conclusion of the NRC report which states "NRC believes that the DOE program, if properly implemented, is adequate to ensure protection of public health and safety. Therefore, the NRC makes no specific recommendations within the scope of this review." NRC has, therefore, reached a far different conclusion than GAO about the need for changes in the DOE approach to safety management. For GAO to selectively cite the NRC report as evidence of a shortcoming while omitting the critical fact that the NRC conclusion directly contradicts the GAO conclusion is misleading and discredits the GAO report.

See comment 10.

- On page 1 and pages 34-35, GAO cites a 2004 letter from the DNFSB to DOE. GAO misquotes the DNFSB in stating "that the possibility of a nuclear accident had grown in part because there was increased emphasis on productivity at the possible expense of safety as well as reduced central oversight of the management of safety by the DOE program offices at the sites with nuclear facilities." GAO is mischaracterizing the DNFSB recommendation and presenting only part of the picture. Unlike the GAO report, the DNFSB provided a balanced assessment by identifying some factors that raise a potential concern about a possible increase in the risk of an accident while also identifying some factors that could decrease such risk (including DOE's ISM program). More importantly, the DNFSB recommendation identified actions to address the potential concerns involving mission and safety priorities and the role of DOE line management. For example, the DNFSB recommended establishment of the CTAs. Since the 2004 recommendation, DOE has established and is implementing actions to meet the DNFSB Recommendation, and the DNFSB has accepted the DOE implementation plan. GAO is using a very specific and narrow quote, from a

DNFSB recommendation, completely out of context in an invalid effort to support its point about conflicting priorities. GAO then uses this mischaracterization of the DNFSB report to support its invalid contention that DOE line management cannot perform its safety oversight role and that DOE needs to restructure the entire oversight structure to put different functions (e.g., safety basis review and approval) within HSS. GAO ignores the fact that the DNFSB recommendations for managing the potential for conflicting priorities are very different from those of GAO and, in fact, conflict with those of GAO. GAO also neglects to mention that DOE has developed an implementation plan for this recommendation that was accepted by the DNFSB to address the underlying concern involving DOE line management responsibility for safety. To misuse the DNFSB recommendation in this manner and to neglect to mention the fact that the GAO recommendations are not consistent with those of the DNFSB is misleading and discredits the GAO report.

See comment 11.

- On page 40, GAO again cites NRC as supporting the GAO conclusion about the inherent conflict of interest with program management oversight. Specifically, GAO cites the NRC suggestion that DOE explore methods to maintain more independence between regulatory oversight and project management functions. However, the NRC suggestion is made in the context of the Office of River Protection line management functions, and GAO is taking it out of context in citing it as support of the GAO position. GAO also omits the overall conclusion of the NRC report which states "NRC believes that the DOE program, if properly implemented, is adequate to ensure protection of public health and safety. Therefore, the NRC makes no specific recommendations within the scope of this review." NRC has therefore reached a far different conclusion than GAO about the need for changes in the DOE approach to safety management with respect to the HSS functions. For GAO to selectively cite the NRC report as evidence of a shortcoming while omitting the critical fact that the NRC conclusion directly contradicts the GAO conclusion is misleading and discredits the GAO report.

6. GAO's conclusions about the structure and independence of HSS are not valid.

On page 6, GAO concludes that "DOE has structured its independent oversight office, the Office of Health, Safety, and Security (HSS), in a way that falls short of meeting our key elements of effective independent oversight of nuclear safety." On pages 6-7, GAO concludes that "While HSS operates separately within the department from the program offices, it no longer is included in the safety review process for new nuclear facilities or significant modifications to existing facilities, it has no representatives at DOE sites, and the head of the office does not have a position comparable to program office heads from which to independently advocate for nuclear safety." These same conclusions are reiterated and expanded on pages 17-19.

See comment 12.

DOE disagrees that carefully considered management decisions on its governance model can be characterized as "shortcomings." As discussed previously and in remainder of this comment, the GAO evidence supporting this statement is flawed and inaccurate, and the GAO report uses a flawed methodology (i.e., evaluates HSS in a vacuum rather than one part of the overall DOE governance model) and thus draws invalid conclusions.

See comment 13.

DOE disagrees with the assertions and the premises of the GAO statement about HSS's independence. The HSS program meets the criteria for independence (as established by GAO on page 5 of the draft report) – HSS is structurally distinct and separate from DOE program offices and avoids management interference or conflict between program office mission objectives and safety. GAO, however, ignores its criteria and demonstrates that it has a preconceived perspective on specific functions that it believes HSS should perform. DOE has chosen to manage in a different way that we believe is more effective. The factors cited by GAO as shortcomings (an approval role in safety basis, onsite representatives, and a Senate-confirmed organizational head) in independence of HSS are not essential elements of an

independent oversight program. In many agencies, the independent oversight functions operate with similar approaches to independence. The Occupational Health and Safety Administration (OSHA) and U.S. Environmental Protection Agency (EPA), for example, do not normally have a regular role in reviewing and approving site ES&H programs (which are analogous to a safety basis) and do not normally have ongoing onsite presence. These agencies are clearly independent of the organizations that they regulate, contradicting the GAO assertion that onsite presence and safety basis approval are essential to an independent oversight program. In addition, the NRC administrator is appointed by the NRC Commissioners and is not Senate confirmed. In this area, GAO has established some artificial and invalid parameters for defining "independence" that are based on its preconceived notion of how DOE should assign particular safety functions. GAO presents no performance data that indicates DOE's alternative approaches are any less effective than the GAO preconceived notions of the management model. DOE believes that the improving performance trends confirm that DOE's management decisions are sound and defensible.

7. GAO's conclusions about technical expertise are not valid and/or are not sufficient to provide a complete and accurate picture.

On page 7, GAO concludes that DOE's technical expertise is shortcoming because "An HSS predecessor office, the Office of Environment, Safety and Health, had more than 20 technical experts in nuclear safety review positions—positions that do not exist in HSS. Moreover, HSS has vacancies for five technical experts in nuclear safety related fields in two subordinate offices. For example, only 2 of the 5 nuclear safety positions in HSS's Office of Enforcement are occupied. In addition, with about half of its overall staff eligible to retire in the next 5 years, HSS will be challenged to maintain its expertise." These same conclusions are reiterated and expanded on pages 20-21.

See comment 14.

With respect to the transfer of 20 positions, DOE disagrees that carefully considered management decisions on its governance model and best use of technical resources can be characterized as "shortcomings." The GAO evidence supporting this statement is flawed and inaccurate, and the GAO report uses a flawed methodology (i.e., evaluates HSS in a vacuum rather than one part of the overall DOE governance model) to draw invalid conclusions. These positions were not eliminated but were transferred to DOE line management where they can be more effective in the overall DOE effort to manage safety. As noted by the GAO, DOE has experienced challenges in getting some sites upgraded to the new standards. Because DOE line management has responsibility for completing the needed upgrades, reassignment of the 20 positions was is in the best interest of DOE. The establishment of the CTAs and the transfer of these positions to the DOE line represent safety improvements and not shortcomings. The individuals were transferred to the line organizations to continue their previous function of supporting line management in implementing their responsibility to review and approve nuclear facility safety basis.

See comment 15.

With respect to the vacancies, the GAO statement was correct when written but does not provide a complete and accurate picture. Most government organizations have vacancies from time to time, and such vacancies are not uncommon for expertise that is in high demand, such as nuclear engineers. GAO fails to present a complete picture of the situation by mentioning the mitigating measures (which are mentioned in subsequent portions of the GAO report), such as the effective use of contractor expertise to complement Federal expertise. By making this statement without the complete context in the Results in Brief section, GAO is presenting an unbalanced picture of the current situation. Also, since the previous discussions with GAO, HSS has recently filled at least one of the open positions in the Office of Enforcement (the text should now read "3 of 5") and is working to fill the others. More importantly, GAO provides no performance data that indicates that HSS has been unable to fulfill its mission because of the vacancies. For example, GAO points to no instances where HSS missed an inspection or an enforcement action because of a few vacancies in the current staffing.

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The statement about potential staffing challenges is correct but would also apply to many DOE organizational elements and many Federal agencies. GAO fails to note that, although DOE is under overall spending constraints, DOE has supported HSS efforts to designate certain nuclear safety positions as critical hires and to maintain an adequate technical resource base, including a judicious balance of Federal personnel and contractor support.

8. GAO's assertions about the Head of HSS are not accurate and are not supported.

See comment 16.

In the cover page summary and other places (i.e., page 7 and page 20), GAO makes incorrect statements about the rank of the Head of HSS (i.e., the Chief Health, Safety and Security Officer for DOE). GAO asserts that the Head of HSS is not at the same rank as the program office heads and that DOE moved the position to a lower level in the department. These statements are not factually correct; the Head of HSS reports directly to the office of the Secretary of Energy (the same rank as the heads of program offices). The only difference is that the Head of HSS is not a presidential appointee or Senate confirmed. GAO presents no evidence that the Head of HSS has any less authority or less access to the Secretary or Deputy Secretary because of this difference. In actuality, the Head of HSS has excellent access to the Secretary and other DOE decision makers, and the authorities of the Head of HSS are at least equivalent to, and sometimes greater than, those of the Head of HHS's predecessor safety organization.

See comment 17.

The GAO report is also misleading to the casual reader in the description of its previous recommendation about the characteristics of the head of the DOE safety organization (i.e., GAO recommends a position that has a long tenure and cannot be removed except for cause). As written, the GAO report implies that DOE has such a position and then degraded it to the current situation. Although it is not clear in the GAO report, Congress has never approved a position with such characteristics in DOE; there was no degradation of authority of the Head of HSS when DOE chose to appoint a career professional to the position.

Comments on DOE Independent Oversight Inspections

9. GAO's conclusions about gaps in the HSS inspection schedule are not completely valid and/or are not sufficient to provide a complete and accurate picture.

In the cover page summary and other places (i.e., pages 7 and 25), GAO refers to gaps in the inspection schedule as evidence of a shortcoming in the HSS Independent Oversight program. Page 7 states "although HSS periodically inspects DOE sites and identifies program deficiencies, there are some gaps in meeting its policy to inspect sites with nuclear facilities at least every 2 to 4 years or more frequently depending on the risks. We determined that HSS, and a predecessor office, did not inspect 8 of the 22 sites where high-hazard nuclear facilities are located in the last 5 years."

See comment 18.

The GAO conclusions in this area are invalid because they are not based on correct facts. The statement that HSS has not inspected eight of 22 sites with high-hazard facilities in the last five years is misleading at best. The sites that GAO misinterprets as gaps are not sites that would warrant a regular inspection because of various factors. For example, most aspects of Portsmouth and Paducah operations are now regulated by NRC and the remaining DOE interests are not high priorities for inspection, and sites such as Mound, Fernald, and Rocky Flats no longer have nuclear facilities (e.g., in the final stages of cleanup with no significant ongoing work that warrants a nuclear safety inspection). As noted in Table 1 of the GAO report, four of the 22 sites that the GAO claims to be high hazard nuclear facilities do not currently have nuclear facilities. Also, the table listing ES&H program inspections is incorrect and misleading. As provided to the GAO auditors, there was an inspection at the Los Alamos National Laboratory during the

fall of 2007. In addition, as provided on the web site referenced, Independent Oversight performed an investigation that included nuclear safety basis elements (engineering, design, configuration management, and safety basis) at the Office of River Protection during 2004 and has performed other oversight activities that examine safety basis elements as part of special reviews and accident investigations. It is worth noting that, following the spill event in 2007, the Office of Environmental Management (EM) proactively requested HSS conduct a rigorous and independent Type B accident investigation. The Type B investigation is another example of Independent Oversight review of Hanford tank farms. Contrary to the GAO assertions, an objective evaluation would conclude that the Hanford Tank Farms and Office of River Protection have received higher levels of attention from both Independent Oversight and enforcement. When all of the correct information is considered, GAO's conclusion that there are gaps in the inspection program is not based on accurate information.

10. GAO's conclusions about the DOE approach to corrective actions for HSS inspections are not valid and/or are not sufficient to provide a complete and accurate picture.

On pages 7-8 and other places (pages 26-27), GAO indicates that "although the program offices are required to develop corrective actions in response to HSS inspection findings, HSS generally does not review the effectiveness of these actions until it returns to the same site for another inspection, which occurred on average approximately every 3 years since 2000 for the 7 sites with the most high-hazard nuclear facilities (from 13 to 38 facilities)."

See comment 19.

The GAO report does not provide a complete and accurate picture of the HSS role in corrective actions. DOE line management has primary responsibility for verifying the effectiveness of corrective actions, which is consistent with ISM principles and good safety management. DOE program offices are required to develop a specific corrective action plan for each HSS finding. HSS often reviews corrective actions on subsequent inspections, which are typically conducted at two to four year intervals.

See comment 20.

The GAO report incorrectly assumes that the scheduled oversight inspections are the only mechanism for reviewing corrective actions. GAO fails to recognize that HSS routinely reviews the DOE line management corrective action plans for HSS findings. HSS specifically looks at the adequacy and timeliness of the plans. HSS also examines compensatory measures, when appropriate. GAO fails to mention that HSS has the option of performing re-inspections or more frequent inspections if circumstances warrant. Such re-inspections are typically performed after about one year and are targeted on the corrective actions. While this option is used rarely (e.g., for situations where significant ES&H issues warrant a near-term re-evaluation), HSS has performed such re-inspections in the past (e.g., a review of the Hanford Tank Farms). GAO also fails to mention that for certain deficiencies, such as HSS findings that identify potential inadequacies in the safety basis, DOE requirements establish a structured process for prompt conduct of reviews and implementation of compensatory measures. GAO also does not consider the frequency of other DOE reviews, such as regular reviews of NNSA sites by the CDNS, in evaluating corrective actions.

Comments on Safety Basis

11. GAO's conclusions about HSS's role in overseeing the safety bases are not valid and/or are not sufficient to provide a complete and accurate picture.

On page 7 (and later on pages 18 and 22-25), GAO concludes that "HSS lacks basic information about the high-hazard nuclear facilities it is supposed to oversee. As of December 2007, HSS did not have accurate information regarding the total number of these nuclear facilities or the number of facilities that lacked an

See comment 21.

See comment 22.

See comment 23.

See comment 24.

approved safety basis meeting requirements set in 2001. We conducted a survey and identified 205 high-hazard nuclear facilities—31 did not have the proper safety basis documentation."

DOE disagrees with this conclusion and the underlying premises. First, HSS is not the DOE organization with primary responsibility for maintaining information about the status of nuclear facilities. DOE line management has this function and reviews and approves the safety basis. The GAO draft report presents no information to indicate that DOE line management is not performing its role in monitoring the status of safety bases for its facilities. The fact that GAO was able to collect its survey results underscores that line management is fully aware of the status of its sites with respect to safety basis documentation. Line management has primary responsibility for ensuring that schedules for upgrading safety bases are appropriately prioritized and met, and must seek schedule exemptions if they go beyond the period outlined in 10 CFR 830. HSS provides independent oversight, on a sampling (but in-depth) manner, to ensure that line management and the contractor are performing their duty to ensure the adequacy of safety bases. HSS fulfills its role by reviewing the status of safety bases during Independent Oversight inspections. These reviews include an evaluation of the fundamental elements of nuclear safety, including design and engineering, safety basis, operations, surveillance and testing, maintenance, configuration management, and quality assurance. The GAO report fails to address the quality of these inspection activities and seems to indicate that safety basis approval is the only element of nuclear safety oversight. Further, HSS, as well as DOE site line management, is well aware that some safety bases need to be upgraded. However, the primary issue of concern to HSS (and DOE line management) is whether the safety basis (whether upgraded or not) accurately reflects the facility conditions and hazards and identifies appropriate controls that have been adequately implemented.

Second, GAO draws some conclusions based primarily on its review of data on DOE's safety basis information system (SBIS), which is not a valid basis for a conclusion about information available to HSS or the state of HSS knowledge. GAO is correct that the SBIS was not up to date in some areas because it has not always been updated by line management. SBIS was established following the issuance of the 10 CFR 830 rule in 2001. The purpose of the SBIS was to make information easily available to the public regarding progress made in upgrading the facility safety basis. This system was not meant to be a real-time reflection of the status of each safety basis, but rather to be periodically updated to show the progress that was being made in the upgrade of safety bases to meet the 10 CFR 830 rule. SBIS is not a database that DOE or HSS relies on for managing nuclear safety. Rather, as discussed previously, line management reviews and approves all safety bases and performs day-to-day oversight of maintenance and implementation. HSS performs oversight of line management effectiveness in performing these activities.

On the cover page summary (and later on pages 31-38), GAO reports "DOE also decided that HSS involvement in reviewing facility safety basis documents was not necessary because this is done by the program offices and adequately assessed by HSS during periodic site inspections." This statement is not complete. GAO fails to mention that an approval process that involves the corporate safety office as an approval authority, which GAO recommends, has been tried and was determined to be ineffective. Also, the GAO report does not identify the time frames for past decisions and provides a misleading impression that DOE has changed practices recently; DOE line management has had responsibility for approving safety bases for more than 15 years.

In short, GAO's conclusions about HSS knowledge of the status of nuclear safety basis is not valid because it is not based on an adequate assessment of HSS roles and responsibilities and is based only on a very narrowly scoped review of one non-essential database that is not used for the purpose that GAO is evaluating. HSS regularly reviews the status of safety bases during Independent Oversight inspections, and it is well aware that some facility safety bases have not been upgraded to meet new 10 CFR 830 requirements and that upgrade actions are continuing. HSS oversight inspections of safety basis focus on the capability of contractors and program and field offices to ensure the quality of safety basis (and their

See comment 25.

See comment 26.

implementation) on a sampling basis using a vertical slice approach for the highest hazard facilities. These reviews are very detailed and are designed to reveal quality issues. We believe that this type of review is more important than simply counting the number of facilities that have been reported as not being upgraded and provides HSS with very good insights to the safety of our nuclear facilities. Contrary to GAO's assertion that HSS does not have the ability to perform reviews and require that the findings be addressed, sites are responsible for looking for and correcting the root cause of identified problems found by HSS inspectors. Issues common to multiple sites are identified and shared with all program offices through HSS's lessons learned program.

Also, GAO is not using terminology correctly and thus is presenting a misleading, inaccurate, and inflammatory perspective. The GAO report statement that some DOE sites "did not have the *proper* (emphasis added) safety basis documentation" is not accurate. All DOE sites have an approved safety basis. Most of these sites have been upgraded to the new and more rigorous standards defined in 10 CFR 830. Some safety bases have not yet been upgraded for various reasons, but these sites are still in compliance with 10 CFR 830 (the regulation recognizes the need for a transition period to upgrade to the new standards in some cases and allows for the use of the existing safety basis until the upgrades are made). In most cases, there are valid reasons why DOE sites have not yet upgraded their safety basis to the new standards. For example, some sites have a limited lifetime because they are scheduled for decommissioning; an upgrade of the facility safety basis for such facilities may be an unwarranted expenditure of resources that provides little additional safety. While it is correct to say that some facility safety bases have not been upgraded, it is not correct to characterize them as noncompliant or inadequate or not "proper" as GAO has improperly done on several occasions in the draft (more often in the summaries in the front of the report).

In some cases, GAO is presenting incomplete information about DOE actions related to safety basis. GAO notes that DOE facilities do not always have a safety basis that meets current standards. With some justification, GAO is critical of the DOE efforts in this area and uses the state of safety basis as support for a DOE shortcoming. However, GAO also notes that about half of the facilities that do not have safety bases that meet current requirements are from the Idaho National Laboratory (INL) and that the current status is the direct result of DOE line management making a conservative safety decision that the previous submittals needed to be improved. We regard this as an example of DOE line management making a proactive decision in the interests of safety. In addition, GAO fails to mention that the responsible DOE line management (Nuclear Energy and Idaho Operations Office) developed a Management Control Plan to ensure safety while the additional upgrades to the safety basis are made. DOE is making progress on implementing this plan, and upgraded safety bases for two of the 14 INL facilities have now been approved. Further, GAO fails to mention that interim measures are being taken by the Office of Nuclear Energy to ensure adequate safety at these facilities until the fully rule-compliant safety basis documents are completed, approved, and implemented. The interim measures include the implementation of interim but robust justifications for continued operations (JCOs) that address the weaknesses identified in the previous safety bases and use focused self-assessments, specific audits, relevant inspections, corrective actions, and reanalysis efforts.

12. GAO's comments about HSS's role in overseeing the JCOs are not sufficient to provide a complete and accurate picture.

On page 7 (and later on pages 22-23), GAO reports that it "found that about one-third of the 205 facilities were in conflict with DOE policy to limit the time that temporary control measures can be used to allow a high-hazard nuclear facility to operate outside of its approved safety basis. Even though HSS is the only independent office with oversight of nuclear safety, it has no role in reviewing these operational decisions."

See comment 27.

DOE agrees that DOE's utilization of JCOs, which allow facilities to temporarily depart from their safety basis to avoid shutting down operations, need improvement. As acknowledged by GAO later in the report, DOE is taking action to clarify DOE's JCO guidance. The GAO report correctly indicates that, in 2007, the DNFSB identified concerns with the use of JCOs. However, the GAO report does not fully evaluate the actions that DOE has taken to address the use of JCOs and only reports that NNSA and EM have issued informal guidance. GAO does not acknowledge that, in 2005, HSS's predecessor organization (EH) recognized similar concerns with the use of JCOs and, with the support of the Energy Facilities Contractors Group (EFCOG) and DOE program and field offices, developed and issued guidance (DOE Guide 424.1-1A, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*) in mid 2006 on the proper use of JCOs. This guidance addressed the length of time that JCOs should remain in place and reinforced a prohibition on their use for planned activities. The main reason the concerns with JCOs still existed in early 2007 (when DNFSB identified its concern) was that the new guide had only been in place for about six months, and sufficient time had not passed to fully incorporate the changes into site procedures and practices. Following the receipt of the DNFSB's April 2007 letter on JCOs, HSS has worked with EM and NNSA to determine what additional actions were needed to improve on the use of JCOs. As the GAO report indicates, in early 2007, EM and NNSA reinforced to the field organization that JCOs are not to be utilized for planned activities. In addition, HSS has worked with EM and NNSA to further clarify the guidance on JCOs. This work has concluded that, in most aspects, the current guidance needed for limiting the lifetime of JCOs and prohibiting the use of JCOs for planned activities is sufficient; however, revision of the guidance document to consolidate all the guidance on the use of JCOs and to add new guidance regarding the content and approval of JCOs is warranted. These improvements are being pursued in coordination with the program and site offices and EFCOG.

See comment 28.

Although the issue with JCOs is valid and is being addressed, DOE does not agree that HSS should routinely evaluate "operational decisions." Such decisions are more properly performed by line management. HSS reviews selected aspects of safety basis, including JCOS, during inspections and has identified deficiencies for corrective actions on a number of occasions.

See comment 29.

The GAO report also states that HSS does not routinely monitor changes to the safety bases of high-hazard nuclear facilities, such as use of JCOs, which allow facilities to temporarily depart from its safety basis to avoid shutting down operations. This statement is misleading since it implies that DOE is not monitoring changes to the safety bases of high-hazard nuclear facilities. DOE line management not only monitors changes to safety bases but also approves them, including any JCOs (which are considered a part of the safety basis). The DOE unreviewed safety question process is much like the NRC's process for review and approval of changes to safety basis. As an independent check, HSS evaluates safety bases and associated JCOs during its ES&H evaluations. For example, in its February 2006 evaluation at the Savannah Review Site, HSS identified a concern that JCOs were inappropriately being utilized for planned activities. DOE does not agree that HSS should routinely evaluate "operational decisions." Such decisions are more properly performed by line management.

See comment 30.

The problems identified by the Safety Board are primarily related to the insufficient guidance on the use of JCOs that existed prior to 2006 and was, for the most part, corrected with the revision of DOE Guide 424.1-1, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*, in July 2006. Line management has taken appropriate actions to ensure the new guidance on JCO use is being implemented, but this will take time. In addition, HSS and line management are making further revisions to the guidance to enhance its usefulness. DNFSB did not attribute the JCO issues to the structure of DOE oversight and indicated its encouragement with DOE's proactive response.

Comments on Enforcement

13. GAO's evaluation of HSS's role in enforcement is misleading and not sufficient to provide a complete and accurate picture of the effectiveness of the enforcement program.

On the cover page summary, GAO concludes that "while HSS uses its authority to enforce nuclear safety requirements, its actions have not reduced the occurrence of over one-third of the most commonly reported violations in the last 3 years, although this is a priority for HSS." Later on page 8 and page 27, GAO concludes that "HSS has the authority to levy civil penalties and take other enforcement actions against contractors that violate nuclear safety requirements, but it has not been able to reduce some recurring violations. This is despite an HSS policy to give priority to addressing longstanding and recurring violations with increased enforcement actions. We found that 9 of the 25 most frequently cited violations of DOE nuclear safety requirements occurred at the same or higher average frequency in 2007 as in 2005. We determined that while HSS had frequently conducted enforcement activities at the sites with the most high-hazard nuclear facilities, they were also the sites where the failure to perform work consistent with technical standards was the most common recurring violation." Later in the report, GAO states that "HSS has not taken primary responsibility for preventing recurring nuclear safety violations because DOE views its role as secondary to the program offices."

DOE believes that these statements are misleading and that the GAO evaluation is too narrowly focused to provide valid feedback on the effectiveness of the HSS enforcement program.

See comment 31.

The GAO does not properly reflect the role of HSS in the overall governance model, and the GAO characterization of the HSS role as secondary in addressing recurring safety violations is inaccurate and misleading. Line management (including the DOE program offices) has primary responsibility for safety and, therefore, for striving to prevent safety violations. GAO appears to be setting the unrealistic and counterproductive expectation that HSS should take over line management's role and affect improvements in DOE contractor performance. This path would be inconsistent with the ISM principle of line management responsibility for safety and inconsistent with the proper role of an independent oversight/enforcement organization. The contractor line management must ultimately take the actions needed to prevent recurrences of events, and line management responsibility and accountability are essential to making this process work. Further, the GAO report is worded in a manner that implies that HSS has made some conscious decision not to act to prevent recurring nuclear safety violations because it is not the organization with primary responsibility. A more accurate characterization would be that HSS has taken deliberate steps to focus on and escalate penalties for recurrent issues, and is continuously evaluating the reported violations to better set its enforcement priorities and better focus its enforcement actions to drive improvements.

See comment 32.

GAO concludes that there are shortcomings in HSS enforcement based primarily on its analysis of Noncompliance Tracking System (NTS) reports and the referenced violations. This evaluation approach (page 28 and Table 2) is too narrow to be meaningful. GAO did not evaluate the more important aspects of the enforcement process, such as the adequacy of the screening process, the quality of the enforcement action, the depth of the enforcement investigations, the technical expertise of the personnel, the validity of the violations, and other such factors. Further, there are a number of problems with the GAO data analysis methods that raise question about any GAO conclusions. One significant conceptual problem is that the GAO analysis attempts to draw conclusions based on the number of violations **reported** to NTS; experience has shown that the number of reported violations is not necessarily an accurate measure of actual performance or the impact of the enforcement program. For example, HSS often notes that reported violations often rise after an event and an HSS enforcement action, which is counter to the expectation that enforcement action will drive the number of violations downward. A closer investigation

of the phenomena, however, shows that reported violations often rise for a time period because sites are more sensitized to potential violations and more active in looking for other noncompliant conditions. An increase in the reported violations may also indicate that the contractor's program is improving, and that the site office and contractor are doing a better job of self-identifying potential noncompliances for corrective action. The bottom line is that any use of the NTS to draw conclusions about actual trends needs to be viewed with caution. A second conceptual problem is that the violation that GAO has chosen to track (performing work consistent with technical standards) is so broad in scope (it encompasses all instances of procedure violations and inadequate procedures) that it is cited in the overwhelming majority of NTS reports and is not an effective parameter for identifying trends. A few other problems include: GAO looks at sites, combining multiple contractors, rather than at individual contractors (possibly masking important trends); the short time frame (less than 3 years) is not sufficient to ascertain meaningful trends; the analysis focuses on sites with an increase in reporting but does not recognize sites showing a decrease in reporting. Overall, the GAO's conclusions are based on an incomplete analysis of NTS data, and the specific methods chosen by GAO raise questions about GAO's technical expertise and level of understanding of complex nuclear safety issues. The broad conclusions that GAO draws are simply not supported or supportable.

See comment 33.

Notwithstanding our concerns with the GAO analysis, DOE agrees that recurrence of violations is a concern. GAO cites examples of recurring violations at the tank farms and waste treatment plant as examples of sites with recurring violations and uses this information to support its contention of shortcoming in HSS performance. GAO also cites an NRC report (although not in the correct context) as supporting a conclusion that some DOE sites have had problems with recurrence controls. We agree that certain DOE contractors have not adequately addressed root causes and thus have experienced recurrences of events. DOE has taken various actions through various methods to promote performance improvements by such contractors. An objective evaluation shows that HSS has been actively involved in pursing enforcement actions against the responsible contractors, when warranted, and that the amount of the penalties was consistent with the nature of the violations. In fact, the portion of the NRC report that GAO cites, is largely based on the results of HSS enforcement activities that identified the problems and subsequent recurrences and took strong enforcement action in both cases. Also, HSS has been devoting higher levels of oversight and enforcement attention to contractors with a record of recurring deficiencies. It is worth noting that a new contractor was recently selected to run the tank farm in the bid process; past contractor safety performance was a factor that would be evaluated in any DOE procurement decision.

Comments on the GAO Recommendations to DOE

14. DOE accepts some of the GAO recommendations but rejects two recommendations as expensive, redundant, and counterproductive to continuous improvement in nuclear safety.

See comment 34.

GAO provided five recommendations for DOE. DOE accepts three in whole or in part, and rejects two. DOE also notes that the one-year time frame for action suggested by GAO may not be reasonable for some of the recommendations because they would be expensive and would require a large number of new hires within HSS; such actions would entail substantial planning and budget increases that would need to be addressed through the DOE budget process.

See comment 35.

- Recommendation #1 calls for HSS approval of safety basis. DOE rejects this recommendation categorically. As discussed in this response, DOE's current approach (e.g., issuance of the 10 CFR 830 regulation, enforcement of noncompliance, establishment of safety system oversight, establishment of the CTAs and CDNS and CNSs, etc.) is more effective and appropriately uses the

best qualified personnel to perform the important safety basis reviews. Coupled with strong HSS independent oversight, the current approach provides DOE with sufficient objective information to make informed decisions and to ensure that the safety bases are adequately reviewed.

See comment 36.

- Recommendation #2 calls for monitoring of safety basis. Although the basis for this recommendation is largely flawed, DOE generally accepts the recommendation. While DOE line management has and will retain primary responsibility for maintaining and monitoring the safety bases, HSS can do more to monitor the overall status of DOE line management progress on finishing current efforts to upgrade safety bases, in addition to continuing to perform detailed reviews of nuclear safety including the quality of safety bases and the effectiveness of DOE line management in implementing their responsibilities. DOE is striving to ensure that all facilities meet the newer standards for safety bases upgrades in a timely manner. As noted in this response, actions are already underway by program offices and HSS to make the needed improvements.

See comment 37.

- Recommendation #3 calls for onsite HSS presence. DOE rejects this recommendation categorically. As discussed in this response, DOE has implemented programs (including Facility Representative and Safety System Oversight programs) that are more effective and more extensive than the GAO recommendation and that meet the same goal. Coupled with strong HSS independent oversight, these programs provide DOE with sufficient objective information to make informed decisions and to evaluate contractor performance and identify deficient conditions for corrective action.

See comment 38.

- Recommendation #4 calls for strengthening enforcement. Although the basis for the recommendation is largely flawed, HSS agrees with the essence of the GAO recommendation and will continue to strive to strengthen enforcement actions to prevent recurring violations. While recurring violations can never be entirely eliminated in any regulated environment – externally regulated or self-regulated – we will continue our efforts to strengthen the enforcement actions through ongoing efforts, such as escalated penalties, where warranted, and continued emphasis on improved causal analysis, use of extent of condition and corrective actions. However, we do not agree that enforcement actions should be governed by measureable goals as GAO suggests (although there is nothing in the report that supports or explains the GAO intent for this part of their recommendation) because the nature of the enforcement program is such that enforcement actions are taken in response to events and noncompliant conditions that must be evaluated on a case-by-case basis and are not suitable to predefined goals.

See comment 39.

- Recommendation #5 calls for public access to unclassified reports. DOE agrees that public access is desirable, as long as security requirements are met. HSS actions were in progress to allow public access to unclassified appraisals before the GAO recommendation was issued. The requisite security reviews were recently completed, and the HSS web site now allows access to recent HSS reports. Also, as a matter of course, HSS regularly briefs relevant members of Congressional staffs on our oversight and enforcement efforts.

Miscellaneous Factual Accuracy Comments

15. There are a number of instances of factually inaccurate information in the GAO report that warrant correction or clarification.

Specific items that are factually inaccurate include:

See comment 40.

- Page 4. The GAO statement "However, in 1999, after further assessment, DOE decided not to pursue such legislation" does not provide a complete picture. A more complete perspective would indicate that, from 1996-1999, a diverse team of DOE senior managers, NRC representatives and interested stakeholders participated in a 3 year review of External Regulation of the Department. Consistent with the more recent NRC Report on the Waste Treatment Plant, the 1996-1999 review concluded that the 3 facilities it reviewed as pilots for external regulation were in compliance with NRC regulations and that the safety benefit gained from external regulation would be minimal when compared to the costs of external regulation.

See comment 41.

- Page 7. GAO is not using terminology correctly and thus is presenting information in a misleading and inaccurate way. The GAO report statement that "there are some gaps in meeting its policy to inspect sites with nuclear facilities at least every 2 to 4 years" is not accurate. It is not accurate to characterize the situation as HSS not meeting a policy. There is an important distinction between not meeting a policy (which is a violation of a requirement and did not occur) and not meeting an internal guideline (the guidance specifically gives management the discretion to evaluate priorities and use resources most effectively, even if the internal guidelines for inspection frequency are not met). While it is correct to say that HSS did not always meet its internal guidelines, it is not correct to characterize this as a failure to meet a policy.

See comment 42.

- Page 7. GAO is not using terminology correctly and thus is presenting information in a misleading and inaccurate way. The GAO report statement that some DOE sites "were in conflict with DOE policy" is not accurate. To be accurate, the phrase "were in conflict with DOE policy" should be changed to "do not fully conform to DOE guidance." It is not accurate to characterize the situation as a conflict with policy.

See comment 43.

- Page 13, Figure 4. Authorization agreements are approved typically by contracting officers/approval authorities at the site office level, not program office levels at Headquarters (HQ) except for Hazard Category 1 nuclear facilities. Review and approval of Nuclear Operations including hazard categorization are approved at the DOE-HQ level for Hazard Category 1 facilities (reactors), not at the site office level, as shown.

See comment 44.

- Page 17. This text discusses the HSS Office of Enforcement role and activities in enforcing compliance with requirements. The report does not address the equally important contractual mechanisms that the program offices may utilize to penalize contractors for poor nuclear safety performance, as well as to engender improved performance. These mechanisms include: assessment reports that direct an identified issue be addressed, show cause letters, stop work direction, conditional payment of fee actions, and contract termination. The Conditional Payment of Fee (CPOF) mechanism has been used fairly extensively within the Office of Environmental Management. For example, since 2005 EM has exercised this mechanism over 10 times for concerns about contractor safety performance. A large number of these actions dealt with failure to rigorously implement integrated safety management system processes, but they also include transportation safety and operational readiness deficiencies. The specific CPOF actions ranged from a warning letter to a reduction in fee for a single instance of $1 million. The cumulative fee lost to all the contractors is almost $4 million.

See comment 45.

- Page 23. The GAO draft report discusses the continued operation of the Chemistry and Metallurgy Research (CMR) facility, referring to a DNFSB report that said it posed a significant risk to workers and the public due to a number of serious vulnerabilities. The report states that the last time the contractor assessed the safety of the facility was 1998. This is factually incorrect. The safety of the CMR facility has been the subject of almost continuous safety review by both the contractor and the

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DOE. It was also subject to a HSS independent oversight inspection during April of 2002. There has been a conscious and dedicated program of risk reduction in this facility, achieved largely by reducing and minimizing the amount of material that could be released in an accident. Several of the wings of the facility have been shut down, and the amount of material at risk in the remaining wings has been reduced to the minimum needed to support program requirements. Where feasible, new activities are not being allowed to start up in this facility, and existing programmatic activities are being consolidated or relocated out of the facility. Although the full safety basis for this facility has not been updated, an update is in process and the technical safety requirements for the facility have been updated. Finally, the report gives the impression that this facility is unsafe. No unsafe situation has been identified by the GAO and, if the DNFSB identifies an unsafe condition, its legislation provides an avenue for obtaining immediate actions to rectify the situation; no such action has been taken or is in process.

See comment 46.

- Page 24. The last sentence of the first paragraph may be inaccurate. For many years, there has been uncharacterized nuclear waste in storage containers at Argonne National Laboratory (ANL), but those materials do not "pose a risk of explosion or fire." There are other types of materials that pose a risk of explosion or fire at ANL, but these are characterized and controlled.

See comment 47.

- Page 25. The GAO report incorrectly states that the INL safety bases will not be upgraded until 2017. The actual plans call for the safety bases upgrades to be complete in 2012. The 2017, in the current draft, may be a typo as the DOE schedules have not changed.

See comment 48.

- Page 26, Table 1, Footnote c, and page 29, Table 3, Footnote c. Brookhaven did not downgrade their Hazard Category 3 nuclear facility to radiological until April 2008 (the GAO report indicates December 2007).

See comment 49.

- Page 29, Table 3. New Brunswick Laboratory is government owned and government operated. Because it is not operated by a contractor, this laboratory would not receive a notice of violation, enforcement letter, or program review. A comparison of this laboratory to contractor-operated laboratories is not valid.

See comment 50.

- Page 30, Figure 6. The data, as shown in the table, is misleading because the graph appears to show an upward trend when the actual trend of nuclear safety violations is downward. While a footnote, for 2007, explains this situation, the graphic presents the incorrect message and could be modified.

See comment 51.

- Page 30-31. The discussion of the enforcement actions at the Office of River Protection seem to infer that the same contractor was involved in all the issues discussed. This text should clarify that the first instance is for the Tank S-102 spill and the enforcement action was for CH2M-Hill Hanford Group, and that the NRC's review of the Waste Treatment Plant regulatory processes would have covered only the Waste Treatment Plant contractor, Bechtel National, Inc. The statement on page 31 that "*NRC's review found that the issues leading to two enforcement actions and the 2008 notice of violation had similarities and could be indicative of program implementation issues in 2003 or 2004 that were not fully addressed and resolved as of 2008*" implies that the contractors were the same. They are not.

See comment 52.

- Page 31 of the report mentions a "2008 notice of violation" for the waste treatment plant. The correct terminology would be a "2008 notice of investigation." There is a distinction between these terms, in that they are different phases of the enforcement action decision process.

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See comment 53.

See comment 54.

See comment 55.

See comment 56.

- On pages 37-38, the GAO report states that HSS told GAO that HSS plans to establish "a dedicated group within the Office of Enforcement to help the program offices identify and address the causes behind the failure to prevent recurring nuclear safety incidents." This is an apparent miscommunication. HSS plans to continue to help program offices identify causes of recurrences through various means on both specific enforcement actions (i.e., through focus on corrective actions) and on a program-wide basis (sharing lessons learned with enforcement coordinators, conferences, and other venues. However, there are no plans to establish a separate dedicated group for such an effort.

- Page 46, Table 4. DOE Policy 410.1, DOE Order 410.1, and SEN 35-91 are not listed. The Department recognizes the orders and manuals in DOE Order 410.1, Attachment 1 (except explosives) as directly related to nuclear safety (e.g., O 413.3A, M 435.1-1 CH1, O 452.1C, O 452.2C, O 460.1B, M 461.1-1 CH1, O 461.1), while Attachment 2 is an additional set.

- Page 51, Appendix IV, Q12a and Q12b. These questions are redundant—amendments to the safety basis are the same as revisions to the safety basis.

- Page 60. GAO states that DOE holds an NRC license, transferred from a utility in 1998, for the operation of an Independent Spent Fuel Storage Installation to store the spent fuel from Three Mile Island, Unit 2, at the Idaho National Engineering and Environmental Laboratory. This is not correct. NRC granted DOE's Idaho Operation Office an original license for this facility in 1999.

The following are GAO's comments on the Department of Energy's letter dated September 10, 2008.

GAO Comments

Our response to DOE's letter is on pages 45 to 49. The following responses are to the detailed comments provided by DOE that were attached to the letter.

1. DOE is incorrect in stating that we did not recognize the primary role of the program offices in nuclear safety. We addressed DOE's self-regulation approach on page 2 of the report and also on pages 13 to 14, as well as through a general discussion of responsibilities on page 36.[1] For example, we provided a figure on page 16, obtained from DOE, of the roles, responsibilities, and authorities within DOE for nuclear safety. We clearly stated our research questions, criteria for evaluation, and the focus on nuclear safety on page 6. In addition, since we did not review the effectiveness of the program offices' nuclear safety oversight programs, there is no basis for DOE to claim that we found this oversight to be ineffective or that we contend that all oversight must be performed by HSS. Moreover, DOE is incorrect in stating that we did not address the functions of the Central Technical Authority. We discussed these functions on page 39. While an evaluation of the role of the Central Technical Authority was not the subject of this review, we added more detail about it on pages 15 and 39.

2. We disagree with DOE's comment that we discounted DOE and HSS perspectives that the former site representative program under a predecessor office did not work very well and resulted in giving conflicting directions to DOE contractors, which degraded the principle of line management responsibilities. We considered these perspectives, which we discussed on pages 37 to 38. We still believe that HSS needs to increase its site presence, but we did not prescribe how this should be accomplished. For example, HSS might increase the frequency of its site inspections or establish a minimal presence at sites with the most high-hazard nuclear facilities. We provided additional detail on page 37 regarding the role of the site representatives and DOE's statement that site representatives from the independent oversight office were providing conflicting directions to the contractors.

[1]The numbers cited in our responses correspond to the page numbers in the report. The numbers cited in the DOE letter correspond to the page numbers in our draft report.

3. We agree with DOE that the lack of HSS involvement in approving the safety basis is intentional, but we continue to believe that this is a valid example of a shortcoming in HSS's functioning as an effective independent oversight office with respect to nuclear safety. DOE further stated that our conclusion is based on an incorrect premise that the program offices cannot perform an adequate review of the safety basis documentation. In addition, DOE stated that the unique nature of the facilities requires that the program office officials at the sites perform the reviews, not headquarters. First, our assessment of HSS's current mission is based on GAO's elements of effective independent oversight, along with supplemental criteria from our past work and HSS guidance. Second, we did not state that the program offices could not adequately review the safety basis documentation on high-hazard nuclear facilities. Third, we disagree that the site offices are the only ones that know enough about the facilities to conduct a safety basis review. For example, DOE acknowledged in its comments that technical staff for the Central Technical Authorities' at headquarters, as well as HSS also get involved in safety basis reviews. According to DOE, the headquarters-based technical staff for the three Central Technical Authorities provide nuclear safety oversight and advice to DOE sites and these authorities. They maintain awareness of complex high-hazard nuclear operations at the sites, including safety basis implementation, nuclear facility startup, and personnel training and qualifications, among other things. In addition, DOE stated that HSS performs periodic site inspections that include nuclear safety basis elements, such as engineering design, configuration management, and safety basis.

4. DOE is incorrect in stating that we found the program office oversight to be ineffective and that all oversight should be performed by HSS. Our point is that HSS—as the only independent oversight office—needs to also participate in the safety basis review process as an important component of DOE's self-regulation approach.

5. We disagree with DOE that potential conflicts of interest between mission objectives and safety will always exist in DOE and other industries that deal with hazardous materials. Our focus in this review was nuclear safety oversight and, as we stated on page 1, virtually all other federal nuclear facilities and all commercial, industrial, academic, and medical users of nuclear materials are regulated by NRC. Because these other entities are regulated by NRC, we also disagree with DOE that its system of checks and balances—with HSS providing an independent check of the program offices and the contractors—is similar to these other industries. The shortcomings we found in HSS as an effective independent overseer of

nuclear safety indicates to us that this system of checks and balances is not in proper balance as it relates to nuclear safety.

6. We disagree with DOE that we misrepresented its position in forming HSS and that we inferred that these actions reduced the effectiveness of HSS's oversight and enforcement functions. The statement about the mission of HSS came directly from a 2006 DOE report that set forth the rationale for establishing this office. According to this report, HSS was established as a corporate safety office similar to corporate safety offices in the commercial nuclear utility industry. However, unlike DOE, corporate safety offices of nuclear utilities operate under NRC regulation. In addition, DOE stated that it made these changes to strengthen HSS independent oversight and enforcement responsibilities by, for example, removing some management responsibilities. This may have been one objective in forming HSS, but we found that reducing some nuclear safety responsibilities and technical resources in HSS that once resided in its predecessor offices contributed to our findings that it does not fully meet our elements of effective independent oversight of nuclear safety.

7. We disagree with DOE that we do not understand its governance model for nuclear safety; as discussed above, we have described this approach in our report. We agree with DOE that we did not attempt to evaluate the effectiveness of DOE's governance model and instead evaluated HSS against our elements for effective independent oversight of nuclear safety to develop our findings, conclusions, and recommendations.

8. We disagree with DOE that our evaluation methods were too narrow in scope to provide a valid assessment of HSS's performance with respect to oversight, enforcement, and technical expertise. Our evaluation methods were appropriate to assess HSS against our elements of effective independent oversight of nuclear safety. An assessment of HSS against these elements and their criteria did not require us to review the quality of the appraisal reports, enforcement actions, or technical staff. Instead, HSS's ability to perform reviews and have its findings addressed relied on criteria to assess the independence of the information available for these reviews, the frequency of the reviews, and the opportunities to independently determine the effectiveness of the actions taken to correct the identified deficiencies. In regard to enforcement, we evaluated the level of recurring violations rather than the quality of the paperwork used to document enforcement actions. Finally, in terms of technical expertise, our criteria required a review of the sufficiency of the staff rather than their technical qualifications. We found shortcomings in each of these areas, which lead to our conclusions and recommendations.

9. We disagree with DOE's statement that we selectively cited an NRC report only to support our findings of HSS shortcomings. We quoted directly from the NRC report, and in several places, we discussed similarities between DOE's and NRC's approach. For example, we discussed how DOE's enforcement program is similar to NRC's program on page 43. However, we have added on page 41 of this report, and in our Conclusions on page 44 that NRC stated that it believes the DOE program, *if properly implemented*, is adequate to ensure protection of public health and safety. Nevertheless, we also pointed out in our report on page 41 that NRC suggested that DOE evaluate how to improve implementation of its requirements and the transparency of its decisions, and also explore ways to gain and maintain more independence between its regulatory oversight and project management functions.

10. We disagree with DOE that we mischaracterized information contained in the Safety Board's Recommendation 2004-1; we quoted directly from the Safety Board's recommendation. However, we revised the report on page 1 to add the Safety Board's statement that DOE has a long and successful history of nuclear safety during which DOE developed a structure and requirements to achieve safety. Nevertheless, we noted on page 2 that our 2007 report found a record of recurring accidents and violations of the nuclear safety requirements at three DOE weapons laboratories. DOE also stated that we did not mention that its implementation plan to create the Central Technical Authority to fulfill one aspect of Recommendation 2004-1 was accepted by the Safety Board. We added this text to the report on page 39.

11. We disagree with DOE that NRC's recent report, which concluded that DOE needs to increase the independence between its regulatory oversight and project management functions, only relates to the program offices and has no bearing on HSS. As our report states on page 41, NRC found that DOE focuses its oversight program on owner responsibilities rather than on nuclear safety requirements and suggested that DOE explore ways to increase independence between regulatory oversight and project management functions. We believe that it is reasonable to conclude from NRC's report that DOE should consider opportunities to strengthen independent oversight both within the program offices and HSS.

12. We disagree with DOE that our identified shortcomings with the structure and functions of HSS are not supportable because we looked at HSS in a vacuum rather than in the context of DOE's governance model. We evaluated HSS against our elements of effective independent oversight of nuclear safety, supplemented with recommendations from past GAO

reports and HSS guidance. In our opinion, this is the role that HSS needs to play in DOE's self-regulation approach.

13. We disagree with DOE's claim that our independence criteria are not essential components for an independent oversight office. We added on page 21 that while HSS is structurally distinct from the program offices, there are also other components of independence that this office should possess, identified in past GAO reports, which are essential for HSS to function in this independent role with respect to nuclear safety. DOE also stated that HSS is similar to Occupational Safety and Health Administration and Environmental Protection Agency as independent oversight agencies without a site presence. However, nuclear safety has always been a special case for intense oversight. The NRC and the Safety Board are very involved in reviewing the safety basis for nuclear facilities, and these two organizations rely heavily on having a site presence at high-hazard nuclear facilities. DOE also said that we did not present any safety performance criteria. While this was not the subject of our review, we did note on page 2 that our 2007 report found a record of recurring accidents and violations of the nuclear safety requirements at three DOE weapons laboratories.

14. We question DOE's justification for shifting the 20 nuclear safety review positions to the program offices from the former Office of Environment, Safety and Health to support oversight by the Central Technical Authority. For example, DOE stated that they placed these technical experts in the authority to help the program offices review and approve their nuclear facility safety basis, in part because of the challenge to get some sites to upgrade the safety basis of these nuclear facilities. DOE fails to acknowledge that it has increased the potential for conflict of interest in the review and approval of the safety basis for nuclear facilities by removing any semblance of remaining independent input to this process that once resided in an HSS predecessor office.

15. We agree with DOE that our assessment of its staffing situation did not provide a complete and accurate picture, such as the use of contractors, in the Results in Brief section of our report. We have added this to our Results in Brief section and also changed the number of current vacancies from three to two in the Office of Enforcement. We did address the use of contractors and other federal resources in the body of the report.

16. We disagree with DOE that the head of HSS has the same rank as a Senate-confirmed head of the program offices, even though they both may have direct access to the Secretary of Energy at this time. At the suggestion of DOE, we have added to the text on page 23 that DOE

officials have emphasized that the head of HSS has excellent access to the Secretary of Energy and other DOE decision makers and that the authorities of this position are at least equivalent to, and sometimes greater than, those of the head of HSS's predecessor offices. Importantly, we note that while the current head of HSS contends that he has access to the Secretary of Energy, there is no guarantee that a future head of HSS will enjoy the same level of access.

17. We clarified in our report on page 23 that our recommendation that the head of the independent oversight office be a Senate-confirmed individual at the same rank as the program office heads was not acted upon.

18. We disagree with DOE that the sites that were not visited by HSS in the last 5 years did not warrant a visit because they no longer have nuclear facilities. The sites with high-hazard nuclear facilities, by DOE's definition, can pose serious consequences from an accident, and all sites that we included in our analysis had nuclear facilities operating within the last 5 years. DOE is also incorrect in stating that we chose not to include a 2007 site investigation of Los Alamos National Laboratory and a 2004 review of the Office of River Protection. We did not include the site investigation of Los Alamos National Laboratory because it was issued outside of the time frame of our analysis. Finally, we noted that the Office of River Protection was included in a lessons learned report but that it was not subject to a separate environment, safety, and health site inspection, and thus, is not reflected in table 1 on page 29 of this report. We added the 2007 accident investigation to the report on page 28, but not in table 1.

19. DOE is incorrect in stating that we did not provide a complete and accurate picture of HSS's role in corrective actions. We stated on pages 19 and 30 that the program offices are responsible for preparing corrective action plans and that HSS has a role in reviewing these plans. While HSS inspection protocols indicate that most sites with high-hazard nuclear facilities should receive a site inspection every 2 to 4 years, we found that HSS had not inspected 8 of the 22 sites that had these nuclear facilities in the last 5 years. We also provided information on pages 40, regarding additional reasons HSS provided for not inspecting some sites on schedule.

20. DOE is incorrect in stating that we assumed that the scheduled oversight inspections are the only mechanism for reviewing corrective actions and that HSS should routinely review these corrective action plans. DOE is also incorrect in stating that we did not mention HSS's option to perform reinspections or more frequent inspections if warranted

and that we did not mention the frequency of other reviews. First, on pages 19 and 30, we addressed HSS's involvement in reviewing the corrective action plans formulated by the program offices. Second, on page 30, we discussed the option to conduct follow-up reviews and found that they were done only five times since 1995. Third, on page 30, we accurately recorded how often HSS returns to sites for subsequent inspections. For example, we found that sites with two and seven high-hazard nuclear facilities, excluding those that no longer have such facilities, were only inspected on average once every 6 years. Finally, we did mention the other site reviews by the program offices, contractors, and now the Central Technical Authority on page 40.

21. We disagree with DOE that HSS is not the organization responsible for maintaining information on the status of nuclear facilities, that upgrading the safety basis of nuclear facilities is not and should not be a primary concern of HSS, and that HSS only needs to be concerned with whether the safety basis accurately reflects facility conditions and that appropriate controls have been implemented. First, HSS is responsible for maintaining the Safety Basis Information System (SBIS) that includes information on the safety basis status of high-hazard nuclear facilities and thus should be more accountable for the reliability of the information in this database because, according to DOE, the database is intended to allow the public to track upgrades of the facility safety basis. Second, we believe that HSS is the most appropriate office to hold the program offices accountable for upgrading the safety bases of their nuclear facilities to meet current requirements because, as our report noted, the program offices have been slow to accomplish this task. Third, as our report states, we believe that HSS needs greater responsibilities in the up front review of the safety basis of new nuclear facilities as well as major modifications of existing facilities because such an independent review reduces potential conflicts of interest inherent in reviews conducted by the program offices.

22. We disagree with DOE that we drew invalid conclusions from the SBIS database regarding the information available to HSS or the state of HSS knowledge. We do not dispute that the SBIS database is not used by HSS or the program offices; however, more effort needs to be made to ensure that the information in this database is updated because it is supposed to be available to the public to check progress made in upgrading facility safety bases. More importantly, this is the only database that attempts to provide information on the number and status of high-hazard nuclear facilities; information that we found was not fully known by the program offices at headquarters, as well as HSS. It seems reasonable to us that HSS should independently assess the accuracy of the information in the

database and use it to monitor the safety basis status of nuclear facilities, particularly the use of JCO.

23. DOE is incorrect in stating that we did not discuss the time frame for the involvement of HSS's predecessor offices in the review of safety basis. We clearly do this on page 36. An evaluation of why the safety bases approval process that existed in HSS predecessor offices may have been ineffective was not the subject of our review.

24. We disagree with DOE that our conclusions about HSS's knowledge of the status of the nuclear safety bases are not valid because they are based on an inadequate assessment of HSS's roles and responsibilities. We based our assessment on the structure and functions of HSS with respect to our elements of effective independent oversight of nuclear safety. We addressed HSS's review process on pages 21 and 25. Starting on page 39 and continuing through page 41, we discuss the factors contributing to the three shortcomings that we believe affect HSS's ability to perform reviews and have its findings addressed.

25. We disagree with DOE that we incorrectly used terminology and, thus, presented a misleading, inaccurate, and inflammatory perspective. DOE said that while it agreed that some facilities do not have an updated safety basis, we characterized this situation as noncompliant, inadequate, or not proper. This is incorrect. We clearly stated on page 26 that 31 nuclear facilities do not have safety bases that meet current requirements. We obtained this information directly from site office officials who we surveyed and who are the most knowledgeable about current conditions. DOE also stated that 10 CFR 830 envisioned a transition period to upgrade the facility safety bases. However, DOE did not mention that this transition period ended 5 years ago. We added language on page 40, as DOE suggested, that some DOE sites have yet to upgrade their safety basis to new standards and that some sites have a limited lifetime because they are scheduled for decommissioning, therefore, upgrading the facility safety basis for these sites may be an unwarranted expenditure of resources to provide little additional safety.

26. DOE agrees that we are justified in pointing out that some nuclear facilities do not have approved safety bases. However, DOE suggested that we failed to mention the interim measures that are being taken by the Office of Nuclear Energy at the Idaho National Laboratory to ensure adequate safety while additional upgrades are made. We have added on page 26 that 2 of the 14 facilities now have approved, upgraded safety bases, and that the Office of Nuclear Energy has put in place JCOs, as well

as additional oversight, to address weaknesses in the previous safety bases for the other facilities until they can be upgraded.

27. DOE generally agreed with our analysis of the JCO issue. However, DOE provided additional information on other actions it has taken since the end of our audit time frame, namely that preparing further guidance regarding the content and approval of JCOs is warranted. We added this text to the report on page 28.

28. We disagree with DOE that HSS should not have a role in monitoring JCO use outside of periodic site inspections because, as our report notes, there have been inappropriate and excessive uses of JCOs that went undetected, in part because there was no central monitoring of their use.

29. DOE is incorrect in stating that we implied that it does not monitor changes to the safety bases of high-hazard nuclear facilities. We only stated on page 27 that HSS does not routinely review changes in the safety bases, such as use of JCOs. However, we did add on page 28 that HSS reviews the use of JCOs during its periodic site inspections.

30. We disagree with DOE that the problems identified by the Safety Board were primarily due to insufficient guidance that existed prior to issuance of DOE Guide 424.1, in July 2006, and that this situation has been corrected with new guidance. Our survey found additional use of JCOs 16 months after the issuance of this guidance. While our survey found that the average days of the JCOs was less than found by the Safety Board in its sample of defense nuclear facilities, we noted on page 27 that the expected duration of these JCOs was almost twice what the Safety Board reported. DOE incorrectly stated that we stated that the Safety Board attributed the prevalent use of JCOs to the structure of DOE oversight.

31. We disagree with DOE that we mischaracterized the role of HSS as secondary to the program offices in addressing nuclear safety violations. We took this characterization directly from information provided to us by HSS. In addition, DOE incorrectly stated that we stated that HSS should take over program office responsibilities. DOE also suggested that we implied that HSS has made some conscious decisions not to act to prevent recurring nuclear safety violations. On the contrary, we stated that HSS has made this a key issue to address with increasing enforcement actions. We only indicated that these actions alone have not impeded the recurrence of 9 of the top 25 violations of the nuclear safety requirements.

32. We disagree with DOE that our use of data in its Noncompliance Tracking System, from which we drew conclusions, is too narrow and

meaningless. DOE also stated that we should be cautious in drawing conclusions from this database. This is the only database that DOE has to track violations despite the limitation DOE mentions for using it in our analysis. We determined that this database was sufficiently reliable for the purposes of our report. Moreover, an HSS official in the Office of Enforcement told us that this database was the main source of information used by this office, even though other databases are also reviewed, and that this office conducts program reviews to ensure that the contractors are entering data correctly. Another Office of Enforcement official told us that this database, the program reviews, and an occurrence reporting database are used to assess recurring and long-standing problems, but that this is assessment is informal and with the current staffing level there are limited resources to conduct the program reviews. In addition, as a check on the reliability of the data, this office also relies on enforcement coordinators at the sites, but this official told us that they work for the program offices and thus have some conflict of interest. In regard to recurring violations, we looked at these violations over a 3 year period across all sites, thereby ruling out outliers that DOE has offered as reasons for ups and downs in the number of reported violations. We also noted on page 32 that entries into this system have averaged around 220 per year since 1999. This suggests to us that our findings would not change if we added more years of violations to our analysis. Finally, we disagree with DOE that our conclusions are simply not supportable. DOE provided no evidence to show that what we found is inaccurate and also agreed with our recommendation that enforcement actions need strengthening. However, we added language on page 31, as DOE suggested to explain that the category of violations for "performing work consistent with technical standards" is broad in scope and includes all instances of procedural violations and inadequate procedures. Nonetheless, our report notes that these violations meet DOE's reporting thresholds for safety significance and reflects on the safety culture at the sites.

33. To eliminate any confusion between the recurring violations at the Hanford Tank Farm and those at the Waste Treatment Plant, we modified the text on page 35 to clarify this distinction.

34. DOE stated that the 1-year time frame to take action for some recommendations may not be reasonable for a variety of reasons. The intent of this 1-year deadline was to encourage DOE to take quick action on what we believe is a critical issue independent oversight at DOE nuclear facilities. While we do not believe that DOE has convincingly argued that our recommendations are necessarily expensive, redundant, and counterproductive, we agree that careful planning is necessary. We

have therefore modified the recommendation to remove the 1-year deadline to address DOE's concerns. However, we note that 31 U.S.C. 720 requires the head of a federal agency to submit a written statement of the actions taken on our recommendations to the Senate Committee on Homeland Security and Governmental Affairs and to the House Committee on Oversight and Government Reform not later than 60 days from the date of our report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of this report. In this written statement, we believe DOE should take the opportunity to detail not only the actions, if any, it intends to take, but also to specify the time required to take these actions in as economical and efficient a way as possible. DOE's statement should also specify what recommendations or parts of recommendations the department does not intend to implement and its reasons. This information could serve as a basis for any additional congressional action, if appropriate, as envisioned by our Matters for Congressional Consideration.

35. We stand by our recommendation that HSS needs to be involved in the review of the safety basis for new nuclear facilities and significant modifications of existing facilities that may raise new safety concerns. We believe that this is a fundamental responsibility of an independent oversight office with respect to nuclear safety.

36. DOE generally accepted our recommendation on the need to increase its involvement in monitoring the safety basis status of nuclear facilities.

37. DOE is incorrect in stating that our recommendation to maintain a site presence for HSS includes an implicit recommendation to eliminate the existing oversight programs of the program offices. We also did not prescribe how HSS would maintain a site presence. However, we have modified this recommendation to replace "maintain" with "increase" a site presence in order to give DOE more flexibility in deciding how to obtain more routine awareness of site operations.

38. DOE agreed with our recommendation to strengthen the enforcement program but did not agree with the need for measurable goals. We modified our recommendation to exclude the requirement for measurable goals for enforcement because it now appears to us that it would be difficult to attribute any decline in recurring violations to only the enforcement actions by HSS because other factors could be attributable to a change, such as actions taken by the program offices.

39. DOE agreed with our recommendation that public access to HSS reports is desirable, as long as security requirements are met.

40. We revised the text on page 4 to more accurately reflect the DOE review of the external regulation option starting in the mid-1990s.

41. We revised the text on page 8 to replace the term "policy" with "internal guidelines."

42. We revised the text on page 8 to state "do not fully conform to DOE guidelines."

43. We made the suggested changes in figure 4 on page 16 to place "authorization agreements," within site office responsibilities.

44. We revised the text on pages 41 to 42 that the program offices can and do use contractual mechanisms to penalize contractors for poor nuclear safety performance, as well as to encourage improved performance. These mechanisms include assessment reports that dictate that a problem needs correction, showing cause letters, stopping work direction, conditional payment for fee actions, and contract termination. For example, HSS officials informed us that since 2005, the Office of Environmental Management has exercised conditional payment of fee action 10 times over concerns about contractor safety performance.

45. We changed the text to clarify that the Chemistry and Metallurgy Research facility is operating under the safety basis established in 1998, although according to DOE this facility has been subject to almost continuous safety review by both the contractor and the department.

46. We are not making this recommended change because we believe that the cognizant program office official at the site has the most accurate information on the facility.

47. We changed the year to 2012 on page 26.

48. We added a note about Brookhaven to table 1 and table 3 on pages 29 and 33, respectively.

49. We added a note about New Brunswick to table 3 on page 33.

50. We changed the data for 2007 to adjust the line in figure 5 on page 34.

51. We revised the text on page 34.

52. We revised the text to include "notice of investigation" on page 35.

53. We revised the text regarding HSS plans to help the program offices identify causes of recurring violations on page 42.

54. We revised the text to add "other nuclear safety guidance" to table 4 on page 54, and changed the number from 26 to 29 rules and directives on page 14.

55. We cannot change the language of the survey instrument because we have already conducted the survey of DOE's high-hazard nuclear facilities.

56. We revised the text to replace 1998 with 1999 on page 67.

Appendix VII: Comments from the Defense Nuclear Facilities Safety Board

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700 Washington, D.C. 20004-2901
(202) 694-7000

September 8, 2008

Mr. Gene L. Dodaro
Acting Comptroller General
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20458

Dear Mr. Dodaro:

The Defense Nuclear Facilities Safety Board (Board) appreciates the opportunity to comment on major items with regard to draft report GAO-08-894, *Nuclear Safety—Department of Energy (DOE) Needs to Strengthen Its Independent Oversight of Nuclear Facilities and Operations*. A separate document offering detailed corrections to the draft will be provided directly to your staff.

It is paramount, in the Board's view, that the report not state that the Board's role is purely "advisory," as this is not correct with regard to statute or practice. While Congress chose not to make the Board a regulatory agency with enforcement authority, in part to avoid potential adverse effects on national security, the Board's statutory powers constitute action-forcing authority. This goes far beyond the offering of "advice" that DOE is free to ignore. In fact, the Secretary of Energy is required by statute to notify Congress and the public if he does not accept a Board Recommendation. The Board has issued 50 Recommendations during its existence, all of which have been accepted and acted upon by the Secretary.

The Board urges that the draft report be amended to fully describe the Board's mission, and the tools given to the Board by Congress to carry out that mission. For the reader of the report to fully appreciate the intent of Congress in establishing the Board's oversight program in 1988, it is essential that the Board's organic statute be fully explained, and the history of its use during the past 19 years be set forth in some detail. This can easily be accomplished by drawing material from the Board's annual reports to Congress and from its current Strategic Plan, which are available on the Board's public website.

Examination of the Board's activities since 1989 will reveal that the Board has never ceased its efforts to strengthen DOE's internal oversight program. Every annual report to Congress, including the first one, issued in 1990, describes the Board's efforts to achieve this mandate. The Board's safety oversight, which includes on-site representatives at DOE sites containing defense nuclear facilities, has been instrumental in protecting the public, the workers, and the environment from hazards associated with defense nuclear facilities. The Board's most recent major initiative in this area is Recommendation 2004-1, *Oversight of Complex, High-*

Hazard Nuclear Operations, which is based upon the record of a series of public hearings held by the Board. While the actions delineated in the Implementation Plan for this Recommendation have not yet been completed in all respects, important results have been achieved. Those results are described in the Board's most recent annual report to Congress (p. 51-52).

The safety oversight mechanisms established by Congress have proven to constitute an effective and economical approach to safety oversight of DOE's defense nuclear facilities. GAO has observed that weaknesses in DOE's oversight remain to be corrected. However, the basic structure and authorities of the existing safety oversight organizations, including the Board, provide a satisfactory framework for this function at those facilities under the Board's jurisdiction.

The Board has always, and will continue to execute fully the statutory authorities assigned by Congress, providing independent safety oversight of DOE's defense nuclear facilities.

Sincerely,

A. J. Eggenberger
Chairman

c: Mr. Eugene E. Aloise
Mr. Daniel Feehan

Appendix VIII: Comments from the Nuclear Regulatory Commission

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 18, 2008

Mr. Gene L. Dodaro
Acting Comptroller General
of the United States
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548

Dear Mr. Dodaro:

The U.S Nuclear Regulatory Commission (NRC) appreciates the opportunity to review the Government Accountability Office draft report, "Nuclear Safety – Department of Energy Needs to Strengthen Its Independent Oversight of Nuclear Facilities and Operations." This report references and comments on a number of NRC documents including the most recent report on the review of the U.S. Department of Energy's Hanford Waste Treatment Plant regulatory process.

NRC's comments on the report are enclosed. If you have any questions, please contact Patricia Silva, at 301-492-3114, or patricia.silva@nrc.gov.

Sincerely,

Michael F. Weber, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure: As Stated

Appendix IX: GAO Contact and Staff Acknowledgments

GAO Contact

Gene Aloise, (202) 512-3841 or at aloisee@gao.gov

Staff Acknowledgments

In addition to the individuals named above, Daniel Feehan (Assistant Director), Jeffrey Barron, Thomas Laetz, Omari Norman, Lesley Rinner, Benjamin Shouse, and Elizabeth Wood made key contributions to this report.