

The Defense Nuclear Facilities Safety Board



STRATEGIC PLAN

FY 2003 – 2009

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THE MISSION

INDEPENDENT HEALTH AND SAFETY OVERSIGHT OF DOE DEFENSE NUCLEAR FACILITIES

The Defense Nuclear Facilities Safety Board (Board), an independent executive branch agency, is charged with providing technical safety oversight of the Department of Energy's (DOE) defense nuclear facilities and activities in order to protect the health and safety of the public and workers. The Board, assisted by a highly qualified staff, is made up of five respected experts in the field of nuclear safety with demonstrated competence and knowledge relative to independent investigations and oversight. Congress established the Board in September 1988 in response to growing concerns about the level of health and safety protection that DOE was providing the public and workers at defense nuclear facilities. In so doing, Congress sought to provide the public with added assurance that the defense nuclear facilities required to maintain the nation's nuclear weapons stockpile are being safely designed, constructed, operated, and decommissioned.

The Board's specific duties and responsibilities are delineated in its enabling statute, 42 U.S.C. § 2286, *et. seq.*, in which the Board shall:

1. Review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of DOE's defense nuclear facilities and recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected.
2. Investigate any event or practice at a DOE defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
3. Have access to and may systematically analyze design and operational data, including safety analysis reports, from DOE defense nuclear facilities.
4. Review the design and construction of new DOE defense nuclear facilities and recommend to the Secretary of Energy such modifications of the design considered necessary to ensure adequate protection of public health and safety.
5. Make such recommendations to the Secretary of Energy with respect to DOE defense nuclear facilities, including the assembly, disassembly, and testing of nuclear weapons, operations of such facilities, standards, and research needs, as determined to be necessary to ensure adequate protection of public health and safety.

THE RISKS

Tons of radioactive and toxic materials exist throughout the defense nuclear complex, and there are many pathways by which these hazards might be released, creating risks to the workers and the public. Consequently, the operation of many of DOE's defense nuclear facilities can pose significant hazards to the environment, the public, and the workers. Most of the facilities in the complex were constructed many years ago and are deteriorating as they age. The integrity of facilities or structures that confine hazardous materials can be threatened by earthquakes, extreme winds, floods, lightning, and other such natural phenomena.

Other potential release mechanisms include inadequate safety controls in new and old facility designs, human errors, equipment malfunctions, chemical reactions, fire, detonation of explosives, and inadvertent nuclear criticality events. Nuclear-related accidents in other countries underscore the significance of the risks in the DOE nuclear weapons operations. For example, on September 30, 1999, a nuclear criticality accident occurred at nuclear fuel processing plant at Tokaimura, Japan. The accident occurred due to human error, serious breaches of nuclear material safety principles, and a mind-set that a criticality accident was incredible. The accident resulted in severe overdoses to three workers, two of whom have died. There have been no criticality accidents in the United States since 1978. However, many DOE facilities contain sufficient amounts of fissionable material such that the risk of an accidental criticality exists and must be controlled.

Also, unpredictable chemical reactions in materials used extensively in defense nuclear work have resulted in several accidents. In 1957, a liquid radioactive waste storage tank exploded at the Mayak, Russia, nuclear complex, contaminating an area equal to the size of New Jersey. It is estimated that this nuclear accident released twice the amount of curies of the Chernobyl reactor accident and forced the evacuation of 11,000 people. The DOE defense nuclear complex includes millions of gallons of radioactive liquid waste which represents a source of hazard that must be addressed.

Identifying potential accident conditions and mitigating their consequences is very important for risk management. Safety is assured by working to understand and reduce the likelihood of events that are adverse to safety and by limiting the consequence of events if they do occur. In addition, safety is assured through robust systems that use multiple layers of protection such that no single layer is depended upon to ensure safety. This concept is called "defense in depth." If hazards and their potential release mechanisms are not carefully addressed, the consequences of a resulting accident could include exposure to unacceptable radiation levels, uptake of radioactive materials, and other serious health and safety consequences for the public and onsite workers.

DOE's nuclear weapons stockpile stewardship and management operations are unique in that they include nuclear explosive activities and experiments involving co-located high explosives and nuclear material. Unlike commercial nuclear facilities, the risks at these defense nuclear facilities are not solely a function of the quantities of nuclear material present, and associated criticality safety concerns, but more importantly, the material processes involved and the potential for explosive dispersal of radioactive materials or inadvertent nuclear detonation.

The Board conducts its oversight of DOE in order to reduce the risks that exist in the defense nuclear complex to the greatest extent possible. The following map of major DOE defense nuclear facilities and sites includes a few examples of the types of hazardous materials and operations of concern to the Board:



- ! *Pantex Plant (Texas)*—Stewardship and maintenance of the nuclear weapons stockpile including assembly, evaluation, maintenance, and dismantlement of nuclear explosives and the storage of special nuclear material, particularly plutonium pits.
- ! *Savannah River Site (South Carolina)*—Operation of existing tritium facilities and design and construction of new facilities for the extraction of tritium, storage of special nuclear material, the stabilization of high-level waste and residual materials from the former production of the nation’s nuclear weapons arsenal, and the disposition of excess plutonium.
- ! *Nevada Test Site*—Stewardship of the nuclear weapons stockpile, including subcritical experiments, and the capability to deal with damaged nuclear weapons and improvised nuclear devices.
- ! *Oak Ridge/Y-12 National Security Complex (Tennessee)*—Stewardship and maintenance of nuclear weapons components including highly enriched uranium processing; fabrication, assembly, and disassembly of nuclear weapon components and subassemblies; and storage of nuclear materials, including uranium from weapon components.
- ! *Los Alamos National Laboratory (New Mexico), Lawrence Livermore National Laboratory (California), and Sandia National Laboratories (New Mexico and California)*—Support for stockpile management and stewardship of the nation’s nuclear weapons, including research and enhanced surveillance of aging weapons, and the processing of nuclear materials.
- ! *Hanford Site (Washington)*—Remediation of high-level radioactive waste, stabilization of corroding highly radioactive spent nuclear fuel currently stored in the K-East and K-West Basins, and stabilization of residual material from plutonium production.
- ! *Rocky Flats Environmental Technology Site (Colorado)*—Stabilization of residuals of plutonium production and deactivation of numerous highly contaminated buildings.

SAFETY OVERSIGHT GOAL

The Board will assist DOE in improving safety at existing and proposed defense nuclear facilities by identifying health and safety issues affecting the public and the workers, recommending actions to address these issues, and ensuring that corrective actions are completed.

To achieve this general goal, the Board has identified the following four interdependent, strategic areas of concentration and has developed performance goals and outcome objectives for each:

AREA 1. NUCLEAR WEAPON OPERATIONS:

Performance Goal: DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the workers and the public.

Stockpile management is the term used to describe the industrial aspects of maintaining the U.S. nuclear weapons stockpile and complex. Board oversight activities for this strategic area focus on assuring that current and planned operations at the Pantex Plant in Texas, the Y-12 National Security Complex in Tennessee, and tritium operations at the Savannah River Site in South Carolina are accomplished safely according to approved standards.

Also included in this strategic area is the DOE stockpile stewardship program, which refers to activities carried out by DOE to ensure confidence in the safety, security, and reliability of nuclear weapons in the stockpile, in the absence of underground nuclear weapons testing. The Board's oversight of the stockpile stewardship program is centered on assuring the safety of the research, development, manufacturing, and testing activities conducted at the Los Alamos National Laboratory in New Mexico, the Lawrence Livermore National Laboratory in California, the Nevada Test Site, and Sandia National Laboratories in New Mexico and California.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board, and the facilities are operated to approved safety standards, rules, orders, and directives. Follow-up technical evaluations of DOE's nuclear stockpile activities will verify necessary improvements in safety.

AREA 2. NUCLEAR MATERIAL PROCESSING AND STABILIZATION:

Performance Goal: The processing, stabilization, and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the workers and the public.

With the shutdown of major weapon production activities at defense nuclear facilities in the early 1990s, substantial quantities of plutonium, uranium, transuranic isotopes, and irradiated fuel have remained in storage for extended periods under potentially unsafe and deteriorating conditions. The Board's focus in this strategic area is to aid DOE in identifying these excess materials and in reviewing DOE's plans/programs to stabilize the materials and place them in a safe configuration for storage pending future programmatic use or disposition.

Board oversight in this area will include the stabilization of spent nuclear fuel at the Hanford Site in Washington and the Savannah River Site in South Carolina, the nuclear waste programs being conducted at the Savannah River and Hanford sites as well as the Waste Isolation Pilot Plant in New Mexico and the Idaho National Engineering and Environmental Laboratory. The Board will also provide health and safety oversight of DOE programs to safely deactivate and decommission facilities at the Hanford and Savannah River Sites, the Y-12 National Security Complex in Tennessee, the Rocky Flats Environmental Technology Site in Colorado, and the Fernald and Mound Sites in Ohio, and the Los Alamos and Lawrence Livermore National Laboratories in New Mexico and California.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluations of DOE's nuclear materials management and facility disposition activities will verify necessary improvements in safety, as DOE meets its commitments to the Board to stabilize and dispose of hazardous nuclear materials.

AREA 3. NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE:

Performance Goal: New DOE defense nuclear facilities, and major modifications to existing facilities, are designed and constructed in a manner that ensures adequate protection of the health and safety of the workers and the public.

To ensure that safety is addressed early in the process, the Board reviews the design and construction of new DOE defense nuclear facilities. These facilities must be designed and constructed in a manner that will support safe and efficient operations for 20 to 50 years. This

requires a robust design process that will ensure appropriate safety controls are identified and properly implemented early in the process. The Board's expectation is that the design and construction phases of defense nuclear facilities will be accomplished under approved nuclear codes and standards, and demonstrate clear and deliberate implementation of Integrated Safety Management (ISM) principles and core functions.

The Board's reviews of the design and construction of major facilities and projects in this strategic area are resource intensive and time consuming, but they result in significant safety improvements. In recent years, there has been an increase in the number of new DOE projects, with 20 to 30 projects in the design and construction phase. Examples of these new projects include the Tritium Extraction Facility, currently under construction at the Savannah River Site; the Hanford Waste Treatment Plant, which is in the design and construction phase; the Highly Enriched Uranium Materials Facility, which is in the design phase at the Y-12 Site; and the Pit Disassembly and Conversion Facility, which is in the design stage at the Savannah River Site.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluations will verify necessary safety improvements in the design and construction of DOE's new nuclear facilities and major modifications to existing facilities. New nuclear facility designs will meet acceptable safety standards.

AREA 4. NUCLEAR SAFETY PROGRAMS AND ANALYSIS:

Performance Goal: DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented; as necessary to protect adequately the health and safety of the workers and the public.

The Board's oversight effort in this area focuses on issues where a complex-wide perspective on health and safety issues across the DOE complex is required to identify and correct generic health and safety problems. Under the aegis of Integrated Safety Management (ISM),¹ significant resources are applied to areas such as the technical competence of DOE's Federal

¹ Integrated Safety Management (ISM) is the means by which the Department of Energy is institutionalizing the process of incorporating into the planning and execution of every major defense nuclear activity those controls necessary to ensure that environment, safety, and health objectives are achieved.

workforce, the efficiency of DOE's line management and safety oversight, and the development and implementation of ISM systems with particular focus on safety analyses and controls. Key supporting functional areas are also reviewed, such as quality assurance, nuclear criticality safety, and training and qualifications.

The Board's reviews in this strategic area often build on data collected at the field level in the first three areas, integrating and analyzing the results to feed back key information that can be used to direct safety program improvement across multiple management lines. For example, at the Board's urging, DOE issued a quality assurance improvement plan to strengthen the implementation of existing quality requirements for safety-related components and systems. Similarly, the Board continues its efforts to ensure that DOE maintains a vigorous nuclear criticality safety infrastructure to support nuclear operations. The Board has been instrumental in driving recent DOE efforts to verify that vital safety systems have been identified throughout the defense nuclear complex and that their condition is understood and controlled.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. In addition, follow-up technical evaluations of DOE's safety programs at defense nuclear facilities will verify necessary improvements in safety, and effective implementation of ISM principles.

Interdependency of These Four Performance Goals:

The interdependence of these four strategic areas of concentration must be understood to appreciate the efficiency of the Board's operating plan and corresponding organizational alignment. "Lessons learned" from the Board's health and safety oversight activities crosscut into each of these four areas. Health and safety hazards identified in Nuclear Material Processing and Stabilization (Area 2) must be transferred to the Nuclear Weapon Operations (Area 1) to avoid or mitigate new remediation issues before they happen. Likewise, the lessons learned from Nuclear Facilities Design and Infrastructure (Area 3) must be shared with managers responsible for preparing and enforcing health and safety-related guidance, requirements, and regulations in Nuclear Safety Programs and Analysis (Area 4).

For example, in order to oversee safety at the Y-12 National Security Complex, the Board must assess the safety of hazardous activities that support the nuclear weapons stockpile (Area 1). To accomplish its general goal, the Board must also assess processing and stabilization of nuclear materials to support facility deactivation, such as Building 9206 (Area 2), construction of new defense nuclear facilities such as the Highly Enriched Uranium Materials Facility (Area 3), and implementation of important safety programs such as criticality safety (Area 4).

Another example of the interdependence of the four strategic areas of concentration is the safety oversight of the Savannah River Site. At this site, the Board must evaluate not only the safety of nuclear material processing and stabilization activities such as disposing of high level waste (Area 2), but also the safety of nuclear weapon support activities involving tritium operations (Area 1), the construction of new defense nuclear facilities such as the Pit Disassembly and Conversion Facility (Area 3), and nuclear safety programs such as high level waste tank integrity inspections (Area 4).

As discussed in Strategic Area 3 above, DOE is designing and constructing many new defense nuclear facilities that will be used to support the nuclear weapon operations and/or nuclear material processing and stabilization. To ensure that DOE protects the health and safety of the public and the workers, the Board must pay close attention to the design, construction, start-up and operation of these facilities, as well as major modifications to existing facilities, including the selection of governing safety standards and requirements.

Equally important, the Board evaluates the directives, standards, and programs governing DOE's safe performance of its hazardous defense nuclear activities. The Board's first three strategic areas of concentration heavily rely upon the implementation of specific DOE rules and directives. The Board's integrated, comprehensive oversight of the safety of DOE's defense nuclear facilities requires that the Board carefully evaluate these safety programs.

The synergy gained from constant information-sharing among the Board's matrixed staff which supports all four strategic areas of concentration is key to achieving the Board's general goal.

MEANS & STRATEGY

HOW THE BOARD CONDUCTS SAFETY OVERSIGHT

Based on more than a decade of operating experience, the Board has developed and refined the means and strategy for maximizing its effectiveness in executing its safety oversight responsibility.

STRATEGY FOR EFFECTIVE SAFETY OVERSIGHT

1. **Ownership of Safety** - The primary responsibility for ensuring protection of the health and safety of the public and workers belongs with DOE line managers and extends in an unbroken chain from the Secretary of Energy to the workers on the floor. Oversight can bolster but never replace the commitment of line management and the workers to integrating proper health and safety practices in work planning and performance.
2. **Oversight Role** - As an external “action-forcing” agency, the Board influences the actions of DOE line management only to the extent necessary to ensure adequate protection of the public and worker health and safety. While the Board is empowered to identify current and potential safety problems and offer alternative strategies for addressing each issue, resolving these safety problems remains the sole responsibility of DOE.
3. **Meaningful Safety Programs** - Effective safety management demands that safety expectations be clearly defined and tailored to specific hazards at all levels—site, facility, and activity. Broad, complicated instructions are ineffective and often ignored at the working level, whereas a safety program that the workers can understand and is relevant to the work is more likely to be embraced by the workers.
4. **Technical Competence** - Technical expertise is required to define and ensure compliance with controls commensurate with the identified hazards. Without sufficient numbers of qualified scientific and technical personnel, DOE cannot act as a knowledgeable and demanding owner/customer who is qualified to require the laboratories and contractors to safely deliver the products and services for which they are being paid.
5. **Risk-based Oversight** - Safety oversight activities are prioritized predominantly on the basis of risks to the public and the workers; the types and quantities of nuclear and hazardous material at risk; and the process and setting of the operations involved. Given the size of the DOE defense nuclear complex and the limited oversight resources of the Board, assigning

review priorities based on perceived risk levels is a continual process influenced by reports from site representatives, staff issue papers, site visits, implementation plans for the Board's recommendations, responses to reporting requirements, correspondence from workers at DOE sites, testimony from public hearings and meetings, and Congressional inquiries.

6. **Effective Transition Planning** - Safety oversight of defense nuclear facilities will be accomplished in full cooperation with other agencies and individual states, in compliance with the Atomic Energy Act of 1954, as amended, and other applicable laws. The Board has worked to ensure a smooth transition from Board oversight to regulation as defense nuclear facilities pass from operations, deactivation, and decommissioning to state and EPA-regulated cleanup, demolition, and environmental restoration activities.

MEANS FOR ACHIEVING EFFECTIVE SAFETY OVERSIGHT

Operating within the framework of its enabling statute and the six principles for effective safety oversight discussed above, the Board has built its oversight operation around: (A) special excepted service personnel authorities that have been the mainstay of the Board's human capital program; (B) a matrix form of organization that provides management the flexibility to quickly reassign technical resources as needed to review emerging health and safety issues; (C) proven information gathering and review techniques; and (D) effective methods for communicating health and safety issues to DOE and the public.

(A) Special excepted service personnel authorities that have been the mainstay of the Board's human capital program

Congress, in the legislation establishing the Board, took steps to ensure that the agency would have the technical expertise necessary to competently exercise its oversight functions by specifying that, "The Board shall be composed of five members . . . who are respected experts in the field of nuclear safety with a demonstrated competence and knowledge relevant to the independent investigative and oversight functions of the Board."

In addition, Congress authorized the Board to use special excepted service hiring and compensation authorities to create a technical staff of the highest caliber. The pay banding and pay-for-performance programs developed and implemented by the Board, using its special hiring and classification authorities, have proven to be effective in building the level of technical competence necessary to perform independent health and safety oversight of the DOE nuclear weapons complex. After years of careful recruiting and selection, the Board's technical staff is composed of approximately 60 scientists and engineers with extensive backgrounds in technical disciplines such as nuclear-chemical processing, conduct of operations, general nuclear safety analysis, conventional and nuclear explosive

technology and safety, nuclear weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. Essentially all of the technical staff have technical masters degrees, and approximately 28 percent have doctoral degrees. Because the Board's Recommendations are based on in-depth technical information and detailed safety analyses, the recruitment and retention of scientific and technical staff members with outstanding qualifications continue to be critical to the successful accomplishment of the Board's mission.

The Board expects its engineers and scientists to maintain the highest level of technical knowledge to meet the wide range of health and safety challenges it faces, and therefore stresses continuing education and professional development for its staff as a means of ensuring that they retain and expand their capability to execute the Board's safety oversight functions with the highest degree of competence. To attract younger staff members, the Board relies on its Professional Development Program (PDP), a 3-year program that brings entry-level technical talent into professional positions within the Board. Through a technical mentor, individuals are provided a series of individually tailored developmental assignments, formal academic schooling, and a 1-year hands-on field assignment. This is a highly competitive program designed to attract the next generation of scientific and technical talent to Federal service.

The Board's ability to accomplish its health and safety mission successfully begins with a determined, focused, and well-executed human capital program. This program uses all available tools to attract and retain the technical talent necessary to accomplish the job that Congress has asked the Board to do.

(B) A matrix form of organization that provides management the flexibility to quickly reassign technical resources as needed to review emerging health and safety issues

The Board's technical staff has been organized specifically to achieve the agency's performance goals and to execute its Strategic Plan and Annual Performance Plans. Using a matrix form of organization, the Board gains management flexibility and avoids the need to establish layers of middle management that divert limited staff resources from performing health and safety reviews. Four interdependent technical groups, staffed with technical specialists having both the education and work experience commensurate with the designated oversight assignments, have been created, each with direct responsibility for achieving one of the four strategic performance goals described in this plan. Depending on the urgency of the issue, the Board may reassign resources among these groups as necessary.

The Nuclear Weapon Programs Program Area is assigned primary responsibility for conducting the health and safety oversight review for Strategic Area 1, Nuclear Weapon Operations. The technical staff members associated with this program area have proven expertise in areas such as conventional

and nuclear explosive technology and safety, nuclear weapons safety, and conduct of operations. Extensive travel to the Pantex Plant, the Oak Ridge/Y-12 National Security Complex, the Nevada Test Site, and the DOE nuclear weapon laboratories is required in order for the staff to assess how DOE and its contractors are actually conducting nuclear weapons stockpile management and stewardship operations in the field.

The Nuclear Material Processing and Stabilization Program Area is assigned primary responsibility for conducting the health and safety oversight review for Strategic Area 2. The technical staff members associated with this program area have proven expertise in areas such as nuclear-chemical processing, materials science and engineering, conduct of operations, storage of nuclear materials, nuclear criticality safety, nuclear facilities engineering, and waste management. Travel to the DOE clean-up projects at the Savannah River Site, the Idaho National Engineering and Environmental Laboratory, the Rocky Flats Environmental Technology Site, and the Hanford Site is required in order for the staff to assess how DOE and its contractors are actually conducting operations to safely disposition the hazardous remnants of weapons production and performing facility decommissioning activities in the field.

The Nuclear Facilities Design and Infrastructure Program Area is assigned primary responsibility for conducting the health and safety oversight review for Strategic Area 3. The technical staff members associated with this program area have highly specialized skills in areas such as seismic engineering of structures, geotechnical reviews, electrical and mechanical system design, and fire protection engineering that are critical to performing the technical oversight reviews of new DOE projects. Extensive travel to the DOE construction projects at the Hanford Site, the Oak Ridge/Y-12 National Security Complex, the Savannah River Site and the DOE nuclear weapons laboratories is required in order for the staff to ensure the safety of the public and workers is addressed early in the design process, and to identify safety flaws during construction that could render a newly constructed facility unusable.

The Nuclear Programs and Analysis Program Area is assigned primary responsibility for conducting the health and safety oversight review for Strategic Area 4. The technical staff members associated with this program area have proven expertise in areas such as Integrated Safety Management, quality assurance, radiological protection, nuclear criticality safety, safety analyses, nuclear weapon responses, and training and qualification programs. Extensive travel to all DOE sites and frequent interactions with DOE headquarters personnel involved with safety programs that cut across DOE management lines are required in order for the staff to assess how DOE and its contractors are actually conducting operations in the field. This conduct is further evaluated against DOE program requirements and guidance to determine if program-level or field-level action to improve safety is warranted.

(C) Proven information gathering and review techniques

The Board stays attuned to the planning and execution of DOE's defense nuclear programs, gathering its information from a broad range of sources, including but not limited to: on-site technical evaluations, critical review of DOE safety analyses by competent technical experts, daily input from Board Site Representatives assigned to the highest priority defense nuclear facilities, and at times, public meetings at headquarters and in the field. After a safety concern is identified, and communicated to DOE, the Board uses the same information sources and techniques to ensure that appropriate corrective actions are developed by DOE and its contractors, commitments are made to implement these corrective actions in a timely manner, and that these commitments are met.

(D) Effective methods for communicating health and safety issues to DOE and the public

Based on an analysis of available information, the Board chooses from the broad spectrum of action-forcing mechanisms granted by law to communicate identified health and safety concerns and promote appropriate DOE corrective actions. These action-forcing mechanisms include formal Recommendations to the Secretary of Energy and, in the case of an imminent threat to public health and safety, to the President; Board correspondence, technical reports, and investigations/inquiries; and staff-level interactions with DOE and its contractors. The Board also uses public meetings to enhance public involvement and awareness of health and safety issues. Copies of most Board communications to DOE can be found on the Board's Web Site at WWW.DNFSB.GOV. A summary of these communication mechanisms follows:

Board Recommendations

Forty-five formal Board Recommendations, consisting of 210 individual recommendations, have been made to the Secretary of Energy concerning actions necessary to protect public health and safety. Each of the 45 sets of recommendations has been accepted by the Secretary of Energy. Thirty-two sets of recommendations have been fully implemented by DOE, with the remainder of the recommendations in various stages of the implementation process.

For example, the Board recently submitted Recommendation 2002-2, *Weapons Laboratory Support of the Defense Nuclear Complex*, to DOE on October 3, 2002, and the Secretary of Energy accepted the Recommendation on January 8, 2003. This Recommendation focuses attention on the fact that the number of experienced engineers who have backgrounds in nuclear weapons design and testing is decreasing rapidly in the DOE defense nuclear complex. The Board believes that the above problem has had a significant effect on accessibility of this expertise to the production sites within the complex, and has adversely affected safety by extending the period of time required for meeting safety commitments. Safe operations in the nuclear weapons complex depend directly upon the

technical abilities of the highly skilled scientists and engineers at the nuclear weapons laboratories. These personnel apply their unique expertise to address the health and safety of operations throughout the complex. The information generated at the laboratories is of little use, however, unless it is disseminated effectively to the relevant operations in the complex. Thus, clear lines of communication are vital to ensure that issues raised anywhere in the complex are properly routed to the laboratories for resolution, that timely answers are developed, and that information generated at the laboratories is transmitted successfully for use throughout the complex.

Board Correspondence

The Board Members, staff, and outside technical experts conduct onsite reviews of health and safety programs and practices, as well as review information provided to the Board from DOE, its contractors, and other interested groups/individuals. If, as a result of these reviews, the Board determines that specific information should be brought to the immediate attention of the Secretary of Energy or other senior DOE officials, the Board will send a letter to DOE with the appropriate background information. Utilizing specific reporting requirement powers contained in the Board's enabling statute, the Board's letter may request, for example, that DOE prepare a report on a health and safety issue by a specified date to ensure that DOE has performed a timely and thorough review of the issue. Since starting operations, the Board has established 150 reporting requirements.

Technical Reports

The Board has developed a series of technical reports addressing various aspects of DOE's operation of the defense nuclear complex that impact public and worker health and safety. These reports provide in-depth discussions of current health and safety problems affecting one or more defense nuclear facilities, or generic topics such as the fundamentals for understanding standards-based safety management at defense nuclear facilities. To date, the Board has issued 30 technical reports.

Inquiries

An important part of the Board's independent oversight program is to receive and respond to oral or written concerns about health and safety conditions at DOE's defense nuclear facilities. Since many of these inquiries come from workers at these sites, the Board respects all requests for confidentiality in order to protect these individuals from potential retaliation. To date, the Board's staff has conducted 115 inquiries into safety allegations raised by concerned individuals.

Staff to Staff Technical Interactions

The Board's staff routinely communicates with their counterparts in DOE, both at the headquarters and the field levels. These exchanges of information, often conducted in face-to-face meetings, provide an efficient means for the Board's staff to gather information on emerging health and safety issues, as well as to provide additional information to DOE staff and their contractors on Board health and safety concerns and questions.

Public Participation

The Board continues to be sensitive to the need for public involvement and awareness of defense nuclear safety issues, and has used open meetings as a forum for communication on Board activities. The Board has continued its practice of meeting with state and local officials, labor leaders, DOE facility workers, public interest groups, and area residents, to exchange information and to inform interested parties of the Board's work. The Board has held a total of 36 public meetings at or near DOE defense nuclear facilities located throughout the United States, as well as held 47 public meetings at or near its Washington, DC offices.

At each of these meetings, the Board invited interested persons or groups to present comments, information, or data pertinent to the purpose of the meeting. Attendance at such meetings has been modest, yet appreciated by the local citizenry with safety concerns and with interest in access to government officials working on their behalf.

RELATIONSHIP BETWEEN THE GENERAL GOAL AND ANNUAL PERFORMANCE GOALS

The Board's safety oversight goal outlined in this Strategic Plan encompasses a broad spectrum of technical areas relevant to the safety of DOE's defense nuclear mission and requires a multi-year effort. Given the fluidity and duration of the Board's mission, the Board measures progress toward achieving its safety oversight goal by developing annual performance goals and associated measures of accomplishment as an integral part of its annual performance plans and reports.

The Board's annual performance plans are featured in our annual budget requests to Congress, where future performance objectives and recent examples of current and past accomplishments are documented by fiscal year. Each annual performance plan establishes specific, short-term objectives for each of the four strategic areas of concentration, commits to a specific number of reviews (output measures) that will be conducted in support of each objective that year, and identifies candidate areas of focus for these reviews. An outcome measure also is explained in the performance plan for each goal, and each annual performance report will provide a qualitative assessment of this outcome.

For example, our performance objectives for the Nuclear Weapon Operations area are summarized from our FY 2004 Annual Performance Plan as follows:

The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The Board's evaluations will be split between DOE efforts to develop safety systems (e.g., system and process designs, safety bases, control schemes, and administrative programs) and DOE efforts to implement aspects of safety management systems. These reviews will focus on activities at the Pantex Plant, Y-12 National Security Complex, SRS tritium facilities, Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratories (SNL), as well as the Nevada Test Site (NTS).

Representative areas for Board and staff review include:

- C Development and implementation of site-wide and facility-specific safety analyses and controls for nuclear facilities and activities (e.g., safety analysis reports developed in response to 10 CFR 830).
- C Annual updates of documented safety analyses (e.g., safety analysis reports developed in response to 10 CFR 830).
- C Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (the W88, W78, B61, W87, and the B83).

- C Conduct of nuclear explosive operations at the Pantex Plant (e.g., weapon programs, special purpose facilities and onsite transportation).
- C Cross-cutting functional areas at the Pantex Plant, Y-12 National Security Complex, or SRS tritium facilities (e.g., nuclear criticality safety, fire protection, nuclear explosive safety).
- C Special studies of unique or significant hazards at DOE nuclear facilities (e.g., classified projects, process technology alternatives such as the saltless direct oxide reduction (SDOR) and microwave casting).
- C Ongoing start-up of enriched uranium operations, hydrogen fluoride systems, and other similar processing activities at the Y-12 National Security Complex.

The Board measures progress toward each outcome measure by evaluating:

- C DOE's acknowledgment of an identified health and safety issue, in response to the Board's communications,
- C The subsequent development by DOE of appropriate corrective actions, and
- C Finally, DOE's implementation of the corrective actions and successful closeout of the health and safety issue.

The Board's Integrated Annual Performance Plans/Budget Request and its Annual Performance Report will document progress in attaining safety improvements in the four performance areas described previously in this Strategic Plan using qualitative outcome measures such as formal DOE and defense nuclear contractor correspondence, Board correspondence and staff reports, DOE and contractor public testimony, and other sources. This measurement approach is consistent with the Congressional requirement for the Board to prepare an Annual Report documenting: (1) improvements in the safety of DOE defense nuclear facilities resulting from Board actions, and (2) unresolved safety problems.

The pace and focus of the Board's health and safety oversight work are controlled, in large part, by DOE's schedule for major actions in the defense nuclear complex. Thus, changes in DOE's schedules and priorities based on circumstances within and beyond DOE's control may require a corresponding change in the Board's oversight plans. When DOE's plans and schedules change, some candidate areas of focus identified in the Board's annual performance plans may also change during the performance period. The Board's Annual Performance Report will describe the alternate project or issue that was selected for review.

KEY FACTORS AFFECTING ACHIEVEMENT OF THE BOARD'S GENERAL GOAL

Planning Assumptions:

The mission of the DOE defense nuclear complex has changed significantly since the Board was established and will continue to evolve. The Board focuses its safety oversight on technical issues associated with mission-specific operations, which can change when DOE's mission shifts. In addition, the Board may identify previously unrecognized safety concerns, which DOE will need to address. As changes occur, the Board may need to redeploy its resources and modify some of its strategic and annual performance planning targets accordingly.

The following general planning assumptions are the basis for the Board's Strategic Plan:

- C U.S. national security policy continues to require nuclear weapons stockpile stewardship and management, along with the supporting human and physical infrastructure. Should U.S. policy require a significant increase in the size or composition of our nuclear stockpile, there would be a corresponding increase in the design and construction oversight workload of the Board. Conversely, should U.S. policy require a significant decrease in the size or composition of our nuclear stockpile, there would be an increase in nuclear weapon dismantlement programs requiring additional oversight.
- C No major accident or safety-related event involving nuclear material occurs at a DOE defense nuclear facility, dictating significant changes in priority and focus of the Board's health and safety oversight programs.
- C The Administration maintains its moratorium on the underground testing of nuclear weapons. Resumption of underground testing, or a major initiative to achieve and maintain an accelerated test readiness program, would require a significant shift in Board resources for safety oversight.
- C DOE's commitment and approach toward the stabilization of nuclear materials and cleanup of contaminated defense nuclear facilities remain consistent with the current approach, as defined in the DOE Strategic Plan.
- C No major changes occur in the Board's current statutory authority or responsibilities.

PROGRAM EVALUATIONS

Congress created the Board as an independent oversight agency to ensure safe operation of DOE's defense nuclear facilities. The House and Senate Armed Services Committees primarily are responsible for conducting Congressional assessments of whether the Board accomplishes its intended purpose, using their annual authorization and oversight review process to evaluate the Board's execution of its statutory health and safety mission, as do the respective Appropriations Committees in the budget review process. The following language, included in the Senate Armed Services Committee Report on the FY 2001 Defense Authorization Act, summarizes the committee's assessment of the Board's (DNFSB) effectiveness:

The committee commends the DNFSB for its continuing efforts to foster positive change in the safety culture at DOE's defense nuclear facilities.... As such, the committee believes that the DNFSB is the most cost-effective means of ensuring continuous improvements of the safety culture at DOE nuclear facilities.

No program evaluations are planned during the next three years.