

**TESTIMONY
OF
THE HONORABLE JOYCE CONNERY, CHAIRMAN
DEFENSE NUCLEAR FACILITIES SAFETY BOARD
before the
COMMITTEE ON ARMED SERVICES, SUBCOMMITTEE ON STRATEGIC FORCES
UNITED STATES HOUSE OF REPRESENTATIVES**

**Review of the President's Fiscal Year 2017 Budget Request
for the Defense Nuclear Facilities Safety Board**

February 11, 2016

Washington, D.C.

Chairman Rogers, Ranking Member Cooper, and distinguished Members of the Subcommittee, thank you for the opportunity to testify on the Defense Nuclear Facilities Safety Board's Fiscal Year 2017 budget request and its related work.

The Board is statutorily mandated to provide independent analysis, advice, and recommendations to the Secretary of Energy to inform the Secretary, in the role of the Secretary as operator and regulator of the defense nuclear facilities of the Department of Energy, in providing adequate protection of public health and safety at such defense nuclear facilities. The Atomic Energy Act of 1954, as amended, currently establishes two categories of facilities subject to Board jurisdiction as generally described as: (1) those facilities under the Secretary of Energy's control or jurisdiction, operated for national security purposes that produce or utilize special nuclear materials; and (2) nuclear waste storage facilities under the control or jurisdiction of the Secretary of Energy.

Under its enabling statute, the Board is responsible for independent oversight of all programs and activities impacting public health and safety within DOE's defense nuclear facility complex—a complex that has served to design, manufacture, test, maintain, and decommission nuclear weapons, as well as other national security priorities. The Board is statutorily mandated to review the content and implementation of DOE standards, facility and system designs, and events and practices at DOE defense nuclear facilities that the Board determines have adversely affected, or may adversely affect, public health and safety. Board oversight is centered on nuclear safety at defense nuclear facilities.

The Board performs safety oversight at facilities throughout the DOE defense nuclear complex to ensure operations are conducted safely. Such oversight is the best way the Board may ascertain whether operations are being conducted with the appropriate formality, identify potential safety problems promptly, and advise the Secretary of Energy... Additionally, many DOE facilities are aging and continue to degrade. Transition to new facilities will take decades. For example, the Chemical and Metallurgy Research Facility at

Los Alamos National Laboratory (LANL) and the 9212 Complex at the Y-12 National Security Complex are of particular concern because of their deficient structures and advanced age. In order to keep the Secretary and the Congress informed regarding the hazards posed by aging facilities and DOE's progress in resolving issues in the design of modern replacement facilities, the Board issues two annual summaries as appendices to its annual report to Congress: one appendix summarizes the status of significant safety issues related to aging infrastructure, and the other summarizes significant unresolved safety issues with DOE's design and construction projects.

Key Oversight Activities

The Board's safety oversight activities are prioritized predominantly on the basis of risk to the public and workers, types and quantities of nuclear and hazardous material at hand, and hazards of the operations involved. During the past year, the Board has dedicated significant oversight resources to safety activities throughout the defense nuclear complex, including:

➤ Emergency Preparedness and Response

On September 3, 2014, the Board issued Recommendation 2014-1, *Emergency Preparedness and Response*, to address deficiencies with DOE's promulgation of and oversight of compliance with requirements. The Board focused staff reviews in 2015 on the assessment of implementation of these requirements at defense nuclear facilities. These assessments included site-specific reviews at the Pantex Plant and Savannah River Site as well as observation of drills and exercises at the Y-12 National Security Complex, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, Pantex Plant, Savannah River Site, and Hanford Site. The review at the Pantex Plant led to the identification of significant issues that warranted near-term resolution. As a result, on November 24, 2015, the Board issued Recommendation 2015-1, *Emergency Preparedness and Response at Pantex*, to address the identified deficiencies.

➤ Safety Basis for Transuranic Waste Operations at Los Alamos Area G

Since 2014, the Los Alamos contractor has declared four Potential Inadequacies of the Safety Analysis (PISA) at Area G, all of which remained unresolved at year's end. These unresolved PISAs included the potential for a release event similar to the one that occurred at the Waste Isolation Pilot Plant (WIPP) on February 14, 2014.

Area G provides Los Alamos National Laboratory's (LANL) current capability for storing and certifying defense-related transuranic (TRU) waste prior to permanent disposal at WIPP. The LANL contractor largely curtailed operations at Area G following initial

indications that a drum of TRU waste generated at LANL was involved in the radiological release event at WIPP. . LANL requires a functioning waste management system to enable programmatic work as well as important risk reduction activities in the Plutonium Facility (PF-4), Chemistry and Metallurgy Research building, and Weapons Engineering Tritium Facility. The WIPP incident has effectively shut down operations at the Area G—WIPP is unable to accept waste, preventing LANL from sending any of the waste from Area G to WIPP.

The Board's staff has reviewed and provided feedback to the Los Alamos contractor and NNSA Field Office personnel on multiple safety basis changes designed to address some of these inadequacies. The Board's staff also observed and provided feedback to NNSA personnel during waste container thermal testing at Sandia National Laboratories (SNL), which will be utilized to support the Area G safety basis. The Board will hold a public hearing to discuss safety issues at Area G in early 2016.

➤ **Recovery Actions at the Waste Isolation Pilot Plant**

Resumption of waste disposal operations at WIPP is essential to eliminate the risks posed by TRU waste stored across the DOE defense nuclear complex. Completing the extensive recovery actions needed to enable resuming operations at WIPP in a timely manner while adequately protecting workers and the public is a challenging task. The Board and its staff have increased safety oversight of WIPP commensurate with its importance and challenge.

DOE released its final investigation report on the vehicle fire on March 7, 2014, and its final investigation report on the release event on April 15, 2015. The investigations identified more than 200 corrective actions required to ensure future WIPP operations can be safely performed. The Board held a public hearing and meeting in Carlsbad, New Mexico on April 29, 2015, to assess progress at WIPP. Members of the Board's staff regularly traveled to WIPP to closely monitor DOE's recovery actions throughout 2015 and prioritized oversight of DOE's efforts to revise the safety basis for waste disposal operations at WIPP to ensure that workers and the public are adequately protected both during recovery operations and once DOE resumes waste disposal operations.

➤ **Criticality Safety at the Los Alamos Plutonium Facility**

In 2015, LANL achieved substantial progress in resuming operations at PF-4 following corrective actions to address long-standing criticality safety program deficiencies. In 2016, the Board's staff will closely follow LANL's efforts to resume the most complex, highest risk operations.

Since 2005, NNSA has recognized that LANL's nuclear criticality safety program does not fully comply with applicable requirements. In 2013, a severe staffing shortage in LANL's nuclear criticality safety group inhibited progress in correcting the deficiencies in this program. On June 27, 2013, the Laboratory Director paused all programmatic activities at PF-4. The Board played a key role identifying new deficiencies and bringing the state of LANL's nuclear criticality safety program to the attention of the laboratory contractor's management and the Secretary of Energy.

NNSA has executed a number of corrective actions, resumed PF-4 operations that pose a lower criticality safety risk, and completed readiness assessments for four of eight higher-risk operations at PF-4. NNSA plans to conduct the remaining PF-4 readiness assessments in 2016. The Board's staff observed the majority of the contractor and federal readiness assessments for these higher-risk operations and found them to be appropriately rigorous. The Board's staff also reviewed the implementation of corrective actions to ensure that they effectively addressed the deficiencies identified in nuclear criticality safety and conduct of operations. The Board's staff will evaluate the adequacy of the readiness assessments scheduled in 2016 for the remaining higher-risk operations at PF-4.

➤ **Earthquake Hazard at the Los Alamos National Laboratory**

The risk posed by an earthquake at LANL remains a significant safety concern. NNSA has completed several structural upgrades to the Los Alamos Plutonium Facility in recent years and plans further upgrades.

In 2009, the Board found that the safety documentation for PF-4 approved by NNSA in December 2008 indicated that the radiation dose consequence to the public following an earthquake and resulting fire could exceed DOE's allowed levels by several orders of magnitude. As a result, on October 26, 2009, the Board issued Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, regarding the need to address the danger posed by an earthquake and subsequent fire at PF-4. In response, NNSA took action to strengthen the structure of the building and to reduce the likelihood and severity of a post-seismic fire. However, additional structural analyses performed using an updated probabilistic seismic hazard analysis found that the facility could collapse following a design basis earthquake.

For resolution of these questions, the Deputy Secretary of Energy directed NNSA in September 2012 to evaluate the seismic vulnerability of PF-4 using a new alternate modeling approach that would enable NNSA to determine the likelihood of facility collapse and the extent of upgrades needed. The engineering firm conducting this alternate analysis completed the first phase in 2014; however, NNSA paused further work and chartered a Seismic Expert Panel to review the results of the first phase of the alternate analysis as well

as a previously completed contractor analysis. The Seismic Expert Panel published its report on March 31, 2015, and subsequently briefed senior NNSA personnel to discuss potential paths forward. The Board and its staff also interacted with senior NNSA management to provide feedback on the report and these potential approaches. NNSA is currently preparing a request for proposal to identify contractors capable of completing the alternate seismic analysis.

Also in 2015, the Board issued a Technical Report entitled *Opportunities for Risk Reduction at the Los Alamos National Laboratory Plutonium Facility through the Minimization of Material-at-Risk* to encourage NNSA to take near-term action to improve the safety posture at PF-4. This report provided a number of actions for NNSA to consider, including the use of robust, certified storage containers for nuclear materials; disposition of materials with no defined use, and effective use of the PF-4 vault and other hardened storage locations. The Board will continue to place a high priority on the seismic vulnerability of PF-4 in 2016, and its staff will continue to follow the design and installation of upgrades at this facility, initiatives to reduce material-at-risk, and the timely completion of the alternate seismic analysis.

➤ **Early Integration of Safety in Design**

The Board supports DOE's efforts to integrate safety concepts at an early stage in design and construction projects. For example, the Board uses "project letters" to provide timely notification of safety issues to DOE at major project milestones (known as "Critical Decisions"). This process ensures that DOE is aware of unresolved safety issues and assists DOE in evaluating a project's readiness to move forward. During 2015, the Board completed five project letters as summarized below.

- *Hanford Site, WTP High-Level Waste Facility, May 8, 2015*—The Board's letter to DOE described open safety issues that require DOE senior management attention to achieve resolution and produce a defensible safety basis for the facility.
- *Savannah River Site, Waste Solidification Building, May 13, 2015*—The Board's letter to NNSA did not identify any unresolved safety issues, but noted that certain activities required for project completion were deferred because the facility was entering cold standby.
- *Hanford Site, Low Activity Waste Pretreatment System (LAWPS), May 14, 2015*—The Board's letter to DOE concluded that no significant safety issues existed at the completion of conceptual design which would preclude the project from advancing. The Board identified three concerns that the LAWPS project plans to address during the preliminary design phase.

- *Savannah River Site, K-Area Complex Purification Area Vault*—In a June 22, 2015, letter to DOE, the Board did not identify any issues that would question DOE’s declaration of project completion. However, in the letter, the Board noted potential vulnerabilities in the facility’s safety posture, and that DOE and the project contractor had already identified opportunities to resolve several of the issues.
- *Y-12 National Security Complex, Electrorefining Project*—In an October 29, 2015, letter to NNSA, the Board concluded that, at the conceptual design phase, the project had appropriately identified structures, systems, and components (SSCs) necessary to confine and control hazardous material, but did not fully analyze some of these SSCs to determine whether they can perform their credited safety functions.

In a letter to the Secretary of Energy dated April 21, 2015, the Board proposed a joint effort to review the processes by which the Board interacts with DOE to identify potential safety issues in the design and construction of new facilities. In the letter, the Board stated that after eight years of experience with the process, both organizations might benefit from a joint review to identify any lessons learned or potential improvements. DOE agreed in a response letter dated June 12, 2015, that performing a joint review would be beneficial to both organizations and identified NNSA and DOE Office of Environmental Management points of contact for this review. The Board and DOE are planning to conduct a workshop as a key piece of this effort.

Review of the FY17 Budget Request

In order to continue execution of its oversight mission to ensure adequate protection of public health and safety at DOE’s defense nuclear facilities and commensurate with the workload generated by DOE in FY 2017, the Board is requesting a total of \$31,000,000 in new budget authority and 120 FTEs. The Board is the only government agency that provides independent scientific and technical safety oversight of DOE’s defense nuclear facilities.

Continued, effective, oversight of the conduct of operations at DOE’s defense nuclear facilities is the only way the Board may ascertain whether operations are being conducted with the appropriate formality, identify potential safety problems promptly, and advise the Secretary of Energy in order to ensure adequate protection of public and worker safety at DOE defense nuclear facilities. This oversight is achieved utilizing the Board’s greatest asset - our people.

Nearly 70 percent (\$22.5M) of the FY17 budget request is dedicated to people - salaries and benefits - for staff and Board members. With this cadre of technical experts at

headquarters and on-site at five DOE defense nuclear facilities, the Board performs its required oversight mission at 10 DOE defense nuclear facilities. In FY17 and beyond, the Board's safety focus at these sites will be on the following:

- **Pantex Plant in Texas.** Stewardship and maintenance of the nuclear weapons stockpile, including assembly and disassembly, surveillance, maintenance, and dismantlement of nuclear weapons and the storage of special nuclear material, particularly plutonium pits;
- **Oak Ridge National Laboratory/Y-12 National Security Complex (Y-12) in Tennessee.** Stewardship and maintenance of the nuclear weapons stockpile, including assembly and disassembly, evaluation, maintenance, and dismantlement of nuclear weapon components; fabrication of nuclear weapon components, including secondaries; processing of highly-enriched uranium; and storage of nuclear materials, including uranium from weapon components. This also includes design and construction of the Uranium Processing Facility;
- **Savannah River Site in South Carolina.** Tritium operations, storage of special nuclear material, stabilization of high-level waste and residual nuclear materials from previous defense nuclear operations, and disposition of excess plutonium. (Note: the Board does not provide oversight of the Mixed Oxide (MOX) Fuel Fabrication Facility. MOX is under the jurisdiction of the Nuclear Regulatory Commission);
- **Los Alamos National Laboratory in New Mexico.** Management and stewardship of the nuclear weapons stockpile, including research and enhanced surveillance of weapons, processing of nuclear materials, pit production, and packaging of radioactive wastes;
- **Lawrence Livermore National Laboratory in California.** Management and stewardship of the nuclear weapons stockpile, including research and enhanced surveillance of weapons, and processing of nuclear materials;
- **Nevada National Security Site.** Stewardship of the nuclear weapons stockpile, including subcritical experiments and criticality experiments, packaging and disposal of radioactive waste, potential nuclear weapon assembly and disassembly operations, and potential operations with damaged nuclear weapons and improvised nuclear devices;
- **Sandia National Laboratories in New Mexico and California.** Management and stewardship of the nuclear weapons stockpile, including research, enhanced surveillance of weapon components, operation of the Annular Core Research Reactor, and packaging of radioactive wastes;

- **Hanford Site in Washington.** Storage and stabilization of high-level waste, stabilization of residual sludge from corroded spent nuclear fuel, stabilization of other residual nuclear material from previous operations, and dismantling and disposition of excess defense nuclear facilities. This also includes design and construction of the Waste Treatment and Immobilization Plant as well as the supporting infrastructure in the Hanford Tank Farms necessary to feed high-level waste to the plant when operational;
- **Idaho National Laboratory in Idaho.** Storage and stabilization of high-level waste, storage of spent nuclear fuel, packaging and disposition of radioactive waste, and dismantling and disposition of excess defense nuclear facilities;
- **Waste Isolation Pilot Plant in New Mexico.** Receipt, handling, and permanent deep geological disposal of transuranic wastes.

The Board has ten full-time site representatives stationed at: 1) Pantex Plant to oversee nuclear weapons activities, including the weapons stockpile stewardship and weapons disassembly programs; 2) Hanford Site to monitor waste characterization and stabilization and facility deactivation; 3) Savannah River Site to monitor DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium; 4) Oak Ridge National Laboratory and Y-12 National Security Complex to monitor nuclear operations supporting the weapons stockpile at Y-12 and cleanup activities at the site's defense nuclear facilities; and 5) Los Alamos National Laboratory to oversee work at its defense nuclear facilities supporting stockpile management and stewardship, including processing of nuclear materials, pit production, and packaging of radioactive wastes.

Finally, the Board is obligated by law to conduct in-depth reviews of new defense nuclear facilities during design and construction to ensure the safety of the public and workers is addressed at a timely stage in the design process. DOE has more than a dozen major design and construction projects currently underway or planned for the near future. The Board will continue to expend considerable resources to review the ongoing design effort and construction activities at new DOE defense nuclear facilities, concentrating its oversight attention on the projects with high risk, significance, and complexity.

Mr. Chairman, in preparing our FY17 funding requirements the Board reviewed its current resources and capabilities and measured it against projected workload. That workload is derived from Congressional direction, current DOE programs and projects, and new DOE programs and projects. The Board believes this request meets the scientific and technical requirements needed to oversee the modernization of the weapons complex and safety of the DOE clean-up program.

Again, thank you for the opportunity to provide this testimony on the Defense Nuclear Facilities Safety Board. I look forward to answering any questions you may have.