

**SENATE ARMED SERVICE COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES**

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DR. EVERET H. BECKNER

**DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS
NATIONAL NUCLEAR SECURITY ADMINISTRATION**

Thank you for the opportunity to appear today to discuss the FY 2004 President's Budget Request for the National Nuclear Security Administration, specifically the Stockpile Stewardship activities carried out by the Office of Defense Programs. The budget request for this vital national security program totals \$6.3 billion, an increase of \$533 million, about 9.1 percent, over the comparable FY 2003 budget request. This request supports the requirements of the Stockpile Stewardship program as defined by Presidential Directives, Department of Defense requirements and the Nuclear Posture Review.

Budget Overview

The budget for Stockpile Stewardship is allocated among three major program lines—Directed Stockpile Work (DSW), Campaigns, and Readiness in Technical Base and Facilities (RTBF). Directed Stockpile Work (DSW) is focused on the maintenance and evaluation of the nuclear weapons stockpile and the refurbishments needed to maintain the stockpile well into the future. The budget request for DSW totals \$1.3 billion, an increase of \$63 million, about 4.9 percent, over the comparable FY 2003 budget request. Campaigns allow the NNSA to move to “science-based” judgments for stewardship, utilizing experiments, simulations, and surveillance data in place of nuclear testing. Campaigns contribute technology needed to carry out the DSW, as well as foster new ideas and concepts that will provide opportunities for cutting-edge improvements to sustain, and if necessary, enhance the effectiveness of the stockpile over the long term. The budget request for Campaigns totals \$2.4 billion, an increase of \$229 million, about 10.6 percent over the comparable FY 2003 budget request. RTBF funding is devoted to operating key defense facilities activities across the weapons complex. The budget request for RTBF totals \$1.6 billion, an increase of \$111.2 million, about 7.4 percent over the comparable FY 2003 budget request. The remainder of the Weapons Activities budget request is composed of Facilities and Infrastructure Recapitalization Program (FIRP), Secure Transportation Asset (STA), and Safeguards and Security (S&S). The budget request for these activities total \$1.0 billion, an increase of \$127 million, about 14.6% over the comparable FY 2003 budget request. FIRP is revitalizing the physical infrastructure of the nuclear weapons complex. STA and S&S protect our assets.

Stockpile Stewardship

The President's FY 2004 request for Stockpile Stewardship continues to build and expand on the scientific and engineering successes that are the hallmarks of this program. It will also allow us to meet our requirements under the terms of the Nuclear Posture Review including enhancing test

readiness, reinvigorating the advanced concepts work in the weapons laboratories, and restoring the weapons complex to meet the national security requirements of the 21st Century. Significant milestones we expect to achieve this year include:

- Manufacture the first certifiable W88 pit;
- Begin irradiation of the first Tritium Producing Burnable Absorber Rods in the TVAs Watts Bar Reactor;
- Continued delivery of W87 Life Extended warheads to the Air Force;
- Complete environmental documentation in support of the Modern Pit Facility;
- Delivery of four ultraviolet beams of NIF laser light to the target chamber;
- Initiate Stockpile Stewardship experiments in NIF;
- Perform 2 and 3 dimensional simulations of aging stockpile weapons focused on LEP activities;
- Safely ship nuclear weapons, weapons components, and nuclear materials through the Secure Transportation Asset;
- Conduct subcritical experiments at the Nevada Test Site to better understand plutonium aging;
- Begin work on the Advanced Concepts and in particular, on the RNEP Phase 6.2 activities with the Air Force.

These major milestones will be accomplished by a weapons complex that will also manufacture the thousands of components needed to maintain the stockpile. The complex will also carry out hundreds of smaller scale experiments, perform surveillance activities, address Significant Finding Investigations, conduct flight tests with the support of the DoD, deploy new manufacturing tools and processes at the production plants, and safely dismantle weapons excess to national security requirements.

These and other activities are dependent on retaining today's highly skilled workforce and recruiting the next generation of stockpile stewards. Over the last several years, NNSA has made significant headway on this all-important front. Critical skill vacancies across the complex have been reduced to 8 percent. Inextricably linked to recruitment and retention is providing the quality workspace and fully functioning tools and technologies needed by our scientists and engineers to carry out their work. Two accounts in the budget, Readiness in Technical Base and Facilities (RTBF) and Facilities and Infrastructure Recapitalization Program (FIRP), are essential to the operation, maintenance, and renewal of physical infrastructure. RTBF provides the funding needed to operate and maintain the facilities required for certification, thus ensuring the vitality of the NNSA national security complex and its goal of a consistent readiness level. FIRP is a capital renewal and sustainability program designed to eliminate maintenance backlogs and restore, rebuild, and revitalize the physical infrastructure of the nuclear weapons complex. FIRP addresses an integrated, prioritized list of maintenance and infrastructure projects, separate from the maintenance and infrastructure efforts of RTBF, which will significantly increase the operational efficiency and effectiveness of the NNSA sites.

I would now like to highlight several activities under the Stockpile Stewardship program that I believe are of particular interest to this committee.

Test Readiness

While I continue to have complete confidence in the ability of the Stockpile Stewardship Program to continue to ensure the safety, security, and reliability of this Nation's nuclear deterrent, we must maintain our ability to carry out nuclear weapons tests. Our current readiness posture to conduct such a test is 24 to 36 months, as established in a 1993 Presidential Decision Directive. Last year's Nuclear Posture Review (NPR) stated that this period should be reduced in order to provide options to deal with defense policy requirements, including the possibility of unanticipated problems in the stockpile. A study completed in July 2002 confirmed that additional work was required to maintain the present posture, but it also led us to conclude that the right posture is to be ready for a test within approximately 18 months. With FY 2003 funding now in place, we intend to begin the transition to an 18-month posture. The Nuclear Weapons Council has concurred that our intended action is appropriate. The transition to this new readiness posture is expected to take approximately three years.

Although there have been discussions about a transition to shorter times there is concern that an unnecessarily expedited time-frame may cause adverse effects on critical personnel resources and require significantly more funding. It is not likely that we will want to be able to match the short lead times when the weapons complex conducted multiple underground tests annually, nor is it prudent to tie-up important resources to indefinitely maintain an extremely short test readiness posture. Since device and diagnostics preparations are driven by the particular weapon to be tested and the questions to be answered by the test, such a posture might not be responsive to a surprise in the stockpile. The NNSA is studying this matter and I will soon be reporting to the Congress on these subjects as directed in the FY 2003 Defense Authorization Bill.

Advanced Concepts / Robust Nuclear Earth Penetrator

The NPR also highlighted the importance of pursuing Advanced Concepts work to ensure that the weapons complex can provide nuclear deterrence options for decades to come. To that end, the FY 2004 budget includes \$21 million for Advanced Concepts work. \$15 million will be allocated to the Robust Nuclear Earth Penetrator (RNEP). The remainder of the funding will be divided between the weapons laboratories for Advanced Concepts work. The vision is for small teams in coordination with DoD to assess evolving military requirements, investigate options, and ensure that DoD understands what is and is not possible. The teams will carry out theoretical and engineering design work on one or more concepts. These activities might proceed beyond the "paper" stage and include a combination of component and subassembly tests and simulations to introduce an appropriate level of rigor to challenge our designers. These activities might also culminate in an integral flight or laboratory test, or a subsequent decision to proceed with further development activities.

On March 19th, the Department of Defense submitted its report on the Robust Nuclear Earth Penetrator (RNEP) as required by the FY 2003 National Defense Authorization Act. Once the 30 days has lapsed, NNSA and the Air Force will begin the required feasibility and cost studies. As members know, this program will examine whether or not two existing warheads in the stockpile – the B61 and the B83 – can be sufficiently hardened through case modifications and other work to allow the weapons to survive penetration into various geologies before detonating. This would enhance the Nation's ability to hold hard and deeply buried targets at risk. The RNEP feasibility and cost study is currently scheduled for completion in 2006; however, we are looking at opportunities to reduce study time.

Stockpile Life Extension

While preparing for the future, the labs and plants are working very hard to extend the life of several elements of the existing nuclear weapons stockpile through the Stockpile Life Extension Program (SLEP). The NPR reaffirmed the decision as reached by the Nuclear Weapons Council on the timing, pace, scope, and technical aspects of the LEPs for the W76, W80, B61-7/11, and ongoing W87 work. Through this program, new subsystems and components are designed, built, tested and installed, thereby extending the operational service life for these warheads for some 30 additional years.

For the last several years, we have been performing the work to extend the life of the W87 warhead for the Air Force. This work is ongoing at Y-12, Lawrence Livermore, Sandia and Pantex. We are more than three quarters of the way through this effort and expect to wrap up the work by early 2004.

Life extension for the W76 involves a comprehensive overhaul of the warhead, including replacement or refurbishment of the Arming, Firing and Fuzing set, high explosives, gas transfer system and other components. We will also be requalifying the weapon primary. For the W80, we will be replacing the Trajectory Sensing Signal and Neutron Generators, the tritium bottles and incorporating surety upgrades. For the B61 we will be refurbishing the secondary. The First Production Units for these systems are presently scheduled for delivery to the Navy and Air Force in: FY 2007, FY 2006 and FY 2006, respectively.

National Ignition Facility

I am pleased to report that tremendous technical progress has been achieved over the last year at the National Ignition Facility (NIF). Its mission is to obtain fusion ignition in a laboratory setting by imploding a BB-sized capsule containing a mixture of the hydrogen isotopes, deuterium and tritium. The NIF will provide the capability to conduct laboratory experiments to address the high-energy density and fusion aspects that are important to both primaries and secondaries in the nuclear stockpile.

In December 2002, the first four NIF laser beams were activated to generate a total of 43

kilojoules of infrared laser light in a single pulse. This equates to about 10 times more power than the entire U.S. electrical generation capacity, but only lasting 5 billionths of a second. In January 2003, NIF delivered its first beam of ultraviolet laser light focused onto a target at the center of the 30 foot-diameter target chamber. With this accomplishment, all elements of each of the NIF critical subsystems has been successfully activated and operated.

On March 6, 2003 the NIF delivered four ultraviolet beams of laser light to the target chamber, 15 months ahead of schedule. Stewardship experiments are slated to begin in FY 2004.

Advanced Simulation and Computing

The Advanced Simulation and Computing (ASCI) Campaign is creating simulation capabilities that incorporate modern physics and engineering models to improve our ability to predict with confidence the behavior of the nuclear weapons in the stockpile. These models, validated against experimental data from past above-ground and underground nuclear tests, are the repositories of expert designer judgment as well as the best scientific representations of our current knowledge of the performance of the nuclear weapons. The ASCI Campaign is driving the integration of the theoretical and experimental efforts within the Stockpile Stewardship Program.

At the same time that ASCI continues the development of the most powerful computer capabilities needed for the future, the modern simulation tools previously developed by ASCI – the Blue Pacific and White Machines at LLNL, the Red Machine at SNL, and the Blue Mountain and Q machines at LANL are being applied day-to-day to address immediate stockpile concerns. ASCI codes are being used to close Significant Finding Investigations as well as to support Life Extension Programs (LEPs) for the W76, W80, W87, and B61. These activities are enabled by the ongoing supercomputing infrastructures at the national laboratories, encompassing both continuing operations as well as research in new techniques for storage, visualization, networking, and all aspects of the infrastructure required by modern computing.

By FY 2008, ASCI will deliver a high fidelity, full-system physics characterization of the functioning events of a stockpile nuclear weapon. At that time, the campaign will deliver a suite of validated codes, running on supercomputer platforms, acquired through open procurement, with user-friendly environments, advanced visualization tools for analysis, and the entire support structure to integrate the components together. Other program deliverables include high-performance storage and high-bandwidth networks. In support of a true integrated SSP effort, the ASCI Campaign continues to push the envelope in distance computing as well as in advanced encryption techniques and other approaches to ensure secure, classified networking.

Office of Secure Transportation

The Office of Secure Transportation is responsible for safely and securely moving nuclear weapons, special nuclear materials, select non-nuclear components, Limited Life Components for the DOE and the DoD. This work is carried out by 225 Federal agents stationed at three

sites--Pantex, Oak Ridge and Albuquerque. These highly dedicated and skilled agents are authorized to use deadly force in the performance of their duties. Employing highly modified tractor trailers and escorts vehicles, and secure and redundant communications they have amassed an impressive safety record of over 100 million accident free miles without cargo compromise. I would note that this office also provides support to other elements of the DOE, including the Offices of Environmental Management and Nuclear Energy.

Pit Manufacturing & Certification Campaign

Restoring the Nation's ability to manufacture plutonium pits in support of the stockpile has been a central challenge for the stewardship program since the closure of the Rocky Flats plant in 1989. Never before has the weapons complex been asked to manufacture and certify pits without nuclear testing. I am very pleased to report that late this Spring, Los Alamos is scheduled to manufacture the first certifiable W88 pit. LANL also remains on-track to manufacture a war reserve pit by 2007. To achieve this critical milestone, LANL has produced a number of development pits and has performed a series of engineering tests and physics experiments to confirm pit performance.

While the TA-55 facilities at LANL are adequate to support the W88 pit campaign, they do not appear to be capable of supporting the manufacturing need for long-term stockpile support. NNSA has begun planning for a Modern Pit Facility (MPF) consistent with the Record of Decision for Stockpile Stewardship and Management and the NPR. In May 2002, the Secretary of Energy formally approved Critical Decision "0" (CD-0) for the MPF. NNSA is now examining 5 candidate sites-- Pantex, Waste Isolation Pilot Plant, the Nevada Test Site, Savannah River and Los Alamos-- as possible locations for the MPF. We expect to issue a Draft Environmental Impact Statement (EIS) later this Spring. Following a series of public meetings, a final EIS and associated Record of Decision will be issued. The program will prepare site specific environmental documentation if the ROD supports a decision to construct and operate a MPF. The FY 2004 request will allow conceptual design and other planning activities, NEPA work, and technology development activities to proceed on a schedule that will support a CD-1 decision in FY 2006.

Tritium

In addition to restoring plutonium manufacturing capabilities, NNSA will begin tritium production later this year when several hundred Tritium Producing Burnable Absorber Rods (TPBARs) are inserted into TVA's Watts Bar Reactor. However because of significant changes in stockpile size in the out- years as a result of the NPR and the Moscow Treaty, NNSA has, in concert with the DoD, adjusted the tritium production requirements to reflect these changes. NNSA remains fully committed to exercise all elements of its system for producing, extracting, and purifying new tritium, including initial operation of the Tritium Extraction Facility (TEF) being constructed at the Savannah River Site (SRS).

Timing of tritium production, extraction, and purification has also been delayed by approximately

17 months for two reasons: (1) under the NPR, stockpile requirements are reduced, and (2) to accommodate delays in completion of the TEF project. This program delay can be accomplished without impacting nuclear weapons readiness. A revised baseline has been approved increasing the Total Project Cost from \$401 million to \$506 million and delaying project completion from mid-FY2006 to late-FY 2007.

Since tritium decays by natural radioactivity at a rate of about 5 percent per year, and since irradiation service costs are the dominant operating costs in supplying tritium to the stockpile, it is prudent not to produce tritium beyond the stated national requirements. Since the program intends to complete and exercise all elements of the tritium production and purification system (including TVA's reactor(s) and the TEF) on a schedule that fully protects the stockpile requirements, irradiation services are being deferred in order to use funds planned for these activities to complete TEF.

Conclusion

Mr. Chairman, let me thank this committee for its strong and enduring support the Stockpile Stewardship Program for the last 10 years. Your support has allowed us to deploy cutting edge technologies to help ensure that the Nation's nuclear deterrent remains safe, secure, and reliable. Because of these tools and technologies we have a much better understanding of the health of the stockpile and have solved technical issues that in the past would have required underground testing. While we are very pleased with the technical progress we have made, we cannot rest on our success. The men and women of the weapon complex will continue to pursue the advanced technologies we will need to answer the scientific and engineering challenges that will confront us in the years ahead.