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U.S. Department of Energy**

**before the
Committee on Armed Services
Military Procurement Subcommittee**

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Mr. Chairman and distinguished members of the Subcommittee, thank you for the opportunity to testify on the Department of Energy (DOE) National Nuclear Security Administration's FY 2001 budget request for Defense Programs' Stockpile Stewardship Program. This request of \$4.594 billion represents a 6.3 percent increase over the comparable FY 2000 level. Due to mission transfers out of the weapons activities account, this request is roughly comparable to a program level of about \$4.7 billion, using previous year comparisons. A detailed summary of the FY 2001 request for Defense Programs is included near the end of the statement.

As part of the FY 2001 budget process, the Administration is also requesting supplemental funding for FY 2000 in the amount of \$55 million to address shortfalls in production readiness at the Kansas City, Pantex, and Y-12 plants. Provision of this supplemental funding is essential to maintain employment levels and skills necessary to support important workloads in FY 2000 and future years and we appreciate this subcommittee's support for our request.

With your support, the program, to date, has achieved some major milestones as we move from underground nuclear test-based to science-based nuclear weapons assessment and certification. Most notably, we are about to certify, for the fourth consecutive year, that the safety, security and reliability of the nation's nuclear weapons stockpile is assured without the need for underground nuclear yield testing at this time. This fourth annual certification of the nuclear weapons stockpile will be transmitted to the President by the Secretaries of Energy and Defense shortly. The people, tools, and technologies supported by this budget make this accomplishment possible.

Our nuclear deterrent remains the foundation for U.S. national security. We believe that our accomplishments and the new budget and management structures we have put in place, along with your continued support, will maintain the success of the Stockpile Stewardship Program in serving our supreme national interest.

MAJOR CHANGES IN PROGRAM PLANNING AND BUDGETING

The men and women of the Stockpile Stewardship Program continue to meet formidable challenges with ingenuity and innovation both in the way we do science and manufacturing, and in the way we organize the work we do. Without the critical work of our Astockpile stewards at the labs, plants and in the federal structure B no program will succeed. Our people remain our number one resource that must be carefully attended now and into the future.

During the past year, for the first time ever in the weapons program, we have organized our tasks according to a streamlined business model. Quite simply, in a world where competition for budget resources is intense, we need to be able to demonstrate clearly that we are taking every step to operate in a cost effective manner B we must use metric that both the folks inside and outside of the program can use to measure our progress.

Our budget request is based on planned performance. It is the outcome of planning processes

that focus our efforts on specific performance goals and strategies that flow from strategic planning. The cycle of planning, budgeting, program execution, and evaluation is the foundation of our program's accomplishments and our initiatives to improve management and accountability to the public.

The FY 2001 budget reflects a new budget structure, which is part of the implementation of the National Nuclear Security Administration. The structure emphasizes the integrated nature of the Stockpile Stewardship Program, and is built upon three principal elements: Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities. Overall, these changes reflect our vision for the future of the program and the nuclear weapons complex.

The FY 2001 budget request is presented in the proposed budget and reporting structure. A more technical discussion of all aspects of the proposed budget structure change is included as an appendix to the Executive Budget Summary document. We are continuing to execute the FY 2000 budget in the current "old" structure as it was appropriated; however, we are also collecting data unofficially in the new structure as a further check on the viability of the approach.

Directed Stockpile Work encompasses all activities that directly support specific weapons in the nuclear stockpile as directed by the Nuclear Weapon Stockpile Plan. These activities include current maintenance and day-to-day care of the stockpile as well as planned refurbishments as outlined by the Stockpile Life Extension Program. Additionally, this category includes: research, development and certification activities in direct support of each weapon system; and long-term future-oriented research and development to solve either current or projected stockpile problems. These activities are conducted at the national laboratories, the Nevada Test Site (NTS), and production plants.

Campaigns are focused scientific and technical efforts to develop and maintain critical capabilities needed to enable continued certification of the stockpile for the long-term. Campaigns are technically challenging, multi-function efforts that have definitive milestones, specific work plans, and specific end dates. The approach was initiated several years ago in the planning and executing the stewardship program. There are currently 17 planned campaigns. These activities are conducted at the laboratories, NTS, production plants, and other major research facilities such as the OMEGA laser at the University of Rochester and the NIKE laser at the Naval Research Laboratory.

Readiness in Technical Base and Facilities (RTBF) provides the physical infrastructure and operational readiness required to conduct the Directed Stockpile Work and Campaign activities at the national laboratories, NTS and the plants. This includes ensuring that facilities are operational, safe, secure, compliant, and that a defined level of readiness is sustained at DP-funded facilities. For the production plants, all site overhead is also included in RTBF.

The new structure proposal also includes separate decision units for Secure Transportation Asset

(formerly Transportation Safeguards Division), Program Direction, and Construction.

Another business practice introduced this year by Defense Programs was the establishment of a rigorous planning process that clearly lays out within each business line, firm programmatic milestones to be achieved within each element of Stockpile Stewardship. The complete program is now defined by a series of program plans that have a five-year planning horizon, each with an accompanying annual implementation plan. Five-year program plans describe the goals and objectives of program elements, and annual implementation plans provide detailed sets of milestones that allow for accurate program tracking and improved oversight.

The rigorous planning that has been done is key to better management, improved focus and sustaining the laboratories as premier scientific and engineering institutions, as well as supporting balanced manufacturing activities necessary to maintain and modernize the stockpile.

Within this business model structure, we have laid out an improved plan, weapon by weapon, part by part, that addresses the tasks required to maintain the stockpile over the next one, five, ten years and beyond. We have support for our program from the Department of Defense (DoD), and the Administration has committed to funding it.

In addition, we have established an Office of Project Management Support to serve as the focal point for all critical construction decisions and performance reviews. It will conduct project readiness reviews and provide technical experts to assist line managers in project planning and execution. It will also serve as a single point of contact for construction policy and procedures, working with program offices and field elements to improve and standardize construction management within Defense Programs.

A key element of the Stockpile Stewardship's continued success is an effective corporate level strategic planning process. We expect to transmit the Fiscal Year 2001 Stockpile Stewardship Plan (SSP), also called *The Green Book* to the Congress shortly. In the development of the SSP, we rely heavily on the DoD, the National Security Council staff, the Office of Science and Technology Policy, the Office of Management and Budget, and other senior policy officials in the nuclear community to help ensure that we continue on the right track.

ACCOMPLISHMENTS

In October 1999, Secretary Richardson ordered a review of the health and status of the nuclear weapons complex and of the status of recruitment, retention and training of top scientists and engineers needed to sustain Stockpile Stewardship. The principal finding of this internal Department of Energy review, led by Under Secretary Ernest Moniz, is that Stockpile Stewardship is on track; both in terms of specific science, surveillance, and production accomplishments and in terms of developing a program management structure that improves the certification process.

Several of the findings of this review will help to shape future decisions in the program. We must continue to prioritize investments, schedules and resources. There are 15 specific actions that emerged from the report's findings. Key among them is the need for DOE and DoD to refine the process for determining the scheduling of stockpile refurbishments over the next several decades to take into consideration military, human, and budgetary needs. We are working with DoD to address this issue right now.

Let me give you just a few examples of how Stockpile Stewardship is already working today:

C In early February our Accelerated Strategic Computing Initiative announced the successful completion of the first-ever three-dimensional simulation of a nuclear weapon primary detonation using the IBM Blue Pacific supercomputer at DOE's Lawrence Livermore National Laboratory. On the supercomputer, this calculation ran for more than 20 days. A desktop computer would have taken 30 years to accomplish the task. Modern nuclear weapons consist of two main components: the primary, or trigger, and the secondary which produces most of the energy of a nuclear weapon. The ability to see and understand the action of the primary is a critically important step in simulating the entire weapon detonation in three dimensions.

∃ Subcritical experiments are being conducted at the Nevada Test Site to understand aspects of weapons physics and the aging properties of plutonium to help: assess the stockpile, qualify the pit production facility at Los Alamos National Laboratory; and subsequently, certify our pit manufacturing. The subcritical experimental program also helps to ensure nuclear test readiness as directed by the President with the current underground test moratorium.

Three subcritical experiments were conducted in FY 1999. We successfully conducted the first FY 2000 subcritical experiment on November 9, 1999. It was one of the *Oboe* series of experiments that are conducted in vessels in the same underground alcove. These experiments are somewhat simpler than the typical full-size subcritical experiment. Since that time, we have conducted two more experiments in the *Oboe* series to study technical issues.

We plan to conduct four additional *Oboe* experiments this fiscal year, as well as one full-sized subcritical experiment, *Thoroughbred*, to measure early time dynamic behavior of special nuclear material. In FY 2001, we tentatively plan to conduct one full-size subcritical experiment and several smaller experiments similar to the *Oboe* series.

∃ In November 1999, the first successful hydrodynamic test at the Dual Axis Radiographic Hydrodynamic Test facility provided a freeze-frame photo of materials imploding at speeds of more than 10,000 miles an hour; allowing scientists to study solids and metals

as they flow like liquids, thus, becoming hydrodynamic when driven by the detonation of high explosives.

- ∃ On January 27, 2000, tests that are key to certification of the W76 Acorn gas transfer system were conducted in the Annular Core Research Reactor at Sandia National Laboratories - five days ahead of our earliest goal. The reactor and all diagnostics and data gathering equipment operated as desired. Initial evaluation of the required data that was obtained from the tests indicate good results for Acorn certification to the stockpile.
- ∃ On August 12, 1999, the first lot of 24 War Reserve, W76 neutron generators were placed in inventory by Sandia National Laboratories (SNL), thus demonstrating the capability lost when our Pinellas plant was closed in 1994. Neutron generators are limited life components that help to initiate a fission reaction. SNL is more than doubling neutron generator production capacity to reflect a request by the DoD to produce enough neutron generators to support both the active and inactive stockpiles. Accelerated Strategic Computing Initiative simulations have enabled the certification of the W76 neutron generator as the first radiation hardened component certified without underground testing.
- ∃ The Kansas City plant has successfully begun production of tritium reservoirs and is meeting new production requirements for the W76, W80 and W88 warheads parts inventories.
- ∃ The Y-12 Plant has resumed uranium processing operations in four of five major mission areas and in portions of the fifth. We are currently working on plans for the difficult resumption of enriched uranium recycle and recovery operations.
- ∃ We have signed a 35-year, \$1.5 billion agreement with the Tennessee Valley Authority (TVA) for irradiation of tritium producing burnable absorber rods beginning in the Fall of 2003 at TVA's Watts Bar and Sequoyah reactors.

A contract for the assembly of the first 6,000 Tritium Producing Burnable Absorber Rods and follow-up fabrication work is expected to be awarded in the next few months. Site preparation and detailed design of a Tritium Extraction Facility are underway at the Savannah River Site. To date, we have made up three months of the FY 1999, 12 month congressionally-mandated moratorium on construction of the facility. The facility is scheduled to begin delivering tritium gas to the stockpile in February 2006.

- ∃ In FY 1998, Los Alamos National Laboratory fabricated development pits for the W88, demonstrating a capability that DOE has not had since the closure of the Rocky Flats Plant in 1989. We expect to produce the first pit qualified for stockpile use in 2001. By FY 2007, a limited capability to manufacture replacement pits for the units destructively evaluated during surveillance activities will be available.

- ∃ DOE has dismantled almost 12,000 weapons since 1990. Disassembly of the W69 was finished at Pantex in FY 1999. DOE plans to finish disassembling the current backlog of retired weapons by the end of FY 2005.
- ∃ The Secure Transportation Asset (STA) has met all direct stockpile maintenance shipment schedules, which currently average 1,000 weapon and 4,000 Limited Life Component shipments per year. A further demand on STA is the need to ship an annual average of 3,000 containers of fissionable materials from DOE sites scheduled for closure to other DOE and customer sites for disposal or remanufacture into fuel elements for nuclear reactors. Overall, STA has transported sensitive cargo more than one hundred million miles since 1975 without compromise of its security or release of radiation.

We have continued upgrades of the STA fleet with new safeguard transporters, secure communication upgrades, and new tractor replacements. Additional security enhancements have been directed in response to security guidance and recent analyses which will accelerate these upgrades and require more intensive agent training and recruitment of additional federal agents. We have included increased funding for this in FY 2001.

The Stockpile Stewardship Program has already been able to solve some problems that in the past would most likely have required a nuclear test to resolve. We expect our ability to solve problems without testing to be greater as new tools and expertise come on-line. Keep in mind that it has been nearly 11 years since we have manufactured a new nuclear weapon and over seven years since the last underground nuclear test, yet our confidence in the safety, security and reliability of the current stockpile remains strong. Nuclear deterrence for our nation demands no less!

THE PEOPLE

At the heart of Stockpile Stewardship is the people who make it work. The Chiles Commission on Maintaining U.S. Nuclear Weapons Expertise offered 12 specific recommendations for action under four broad categories: national commitment, program management, personnel policies, and oversight. A key driver in the time frames within which we have been planning and executing the program has been the fact that scientists and engineers with nuclear test experience are nearing retirement age and will be leaving the program in large numbers over the next decade. To transfer the knowledge they have to a new generation is vital so that the role of testing in the process of maintaining our stockpile is well understood in all its dimensions. To make that crucial transition properly we must retain experienced test workers while we recruit and train new workers

In addition, we are attempting to make that transition in a booming economy where technical

expertise is highly recruited and rewarded by the private sector. The skill mix at the laboratories will shift away from nuclear test-based expertise toward a more science-based expertise for maintaining the nuclear weapons stockpile. At the production plants, there will be more emphasis on computer and network-based design tools and advanced manufacturing techniques. These changes in skill mix are major recruiting and retention challenges facing us right now.

There are fewer opportunities to conduct exploratory research at the laboratories due to limits on Laboratory Directed Research and Development (LDRD), which has been a key source of new talent and training at the laboratories. A pay freeze implemented in the early 1990s has resulted in loss of market position for the salaries of scientists and engineers, especially in highly competitive areas such as information science and technology. Increased security requirements may also affect recruitment and retention. Such factors make it more difficult to recruit and retain top scientific talent for Stockpile Stewardship.

Defense Programs is addressing many of these and others issues through actions to implement the Chiles Commission recommendations. Among them is the request for supplemental FY 2000 funding to avoid further layoffs at the plants and to maintain critical skills which you have favorably considered. The FY 2001 request also provides stability in plant funding with some flexibility to address skill mix concerns. For the nuclear weapons labs, the FY 2001 request maintains our commitment to balance the pace and scope of security requirements implementation with preservation of the research environment. To that end, a restoration of LDRD funding to six percent for FY 2001 has been requested. The FY 2001 budget also provides for stability in employment and increases in support for the varied work of science-based stewardship at the labs.

HOW STOCKPILE STEWARDSHIP WORKS

Let me briefly summarize the Stockpile Stewardship process and the challenges it now faces before I go into a more detailed discussion of program elements. Each year, eleven samples of each type of weapon are returned from the active force and are disassembled, examined, tested, and analyzed for defects. If defects are found, their effect on reliability and safety is assessed. Some parts, like neutron generators and gas reservoirs, require replacement at regular intervals, as limited life components. Other parts of a nuclear weapon are made from radioactive materials which decay; and as they decay, both their own properties and the properties of other materials within the weapon may change.

Remanufacturing replacement parts for our nuclear weapons sounds simple enough, but since the time that many of the current weapons in the stockpile were originally manufactured, some of our production plants have been closed and manufacturing processes, techniques and standards have changed. We must adhere to more stringent health and safety standards, and are more concerned about the proper handling and storage of nuclear waste materials. Today, replacement parts require even tighter production controls than the extraordinarily rigid standards under which the original parts were designed and manufactured. A nuclear weapon, less than the size of a small

desk, has enough explosive power to completely destroy a modern city, and yet it must be able to survive extraordinary accidents with less than a one-in-a-million chance of exploding. Industrial materials advancements and new manufacturing processes make it difficult, if not impossible, to get exact replacement parts. Yet, we in the nuclear weapons program, must produce replacement parts using modern material and processes that will still maintain the safety and reliability of our weapons while certifying their safety, security and reliability without underground nuclear testing.

As our stockpile weapons continue to age, we expect more parts to require replacement. Because new warheads have not been produced since 1988, we are not replacing old weapons with new ones. In about ten years, most of our weapons designers with nuclear testing experience will have retired. This means that when our newest system, the W88, reaches the end of its original design life in 2014, we may no longer have anyone with the test-based job experience to help us evaluate modifications that may be required due to aging at that time. Successfully dealing with this time factor is critical to the success of the Stockpile Stewardship Program.

Instead of an underground nuclear test, we can conceptually divide the explosion sequence into each of its parts, then test and analyze each of these separately. We plan to put all the data together into a computer calculation -- a simulation -- to see if the resulting performance is within its original specification. Each part of the simulation must predict the results of each of the separate tests, and where they exist, the results must be consistent with archived underground nuclear test data and research. These simulations will be validated with state of the art experimental tools such as the Dual Axis Radiographic Hydrodynamic Test facility and the National Ignition Facility. We also hope these modern codes and experimental tools will serve to attract and maintain a cadre of outstanding technical staff, the grand challenge of stockpile stewardship.

STOCKPILE LIFE EXTENSION AND SURVEILLANCE

We are working closely with the DoD to finalize detailed plans to indefinitely extend the lifetime of each weapon system in the stockpile. The Stockpile Life Extension Program (SLEP) is DOE's planning framework for a proactive management of system maintenance activities. Under SLEP, options are developed to address potential refurbishment actions. These life extension options address: "musts"-- to correct known problems; "shoulds" to prevent foreseeable problems; and "coulds" to improve safety, use control and other items given the opportunity while working. Amusts≡ and Ashoulds.≡ These life extension options allow the DOE and DoD to anticipate and plan for future resource requirements such as workforce, skills mix, equipment, and facilities. These requirements provide the framework for: our surveillance of the stockpile and stockpile research and development activities at our laboratories, guiding our production plants in validation of new materials, and development and certification of new manufacturing processes. The cycle is continuous and is closely integrated. Data and information from our surveillance programs and from the hundreds of experiments and simulations being performed, help to

identify which parts of a weapon are aging gracefully, and which parts present current and potential future problems.

Stockpile surveillance has been a major element of the U.S. nuclear weapons program ever since the first weapons were put into service. Approximately 1,100 stockpile weapons are thoroughly examined each year. The results provide data not only for assessing the current safety and reliability of the stockpile, but also for developing predictive models and age-focused diagnostics required to anticipate weapons refurbishment requirements.

The Enhanced Surveillance Program (ESP) is developing the technologies and methods, as well as a fundamental understanding of materials properties and weapons science, to significantly improve detection and predictive capabilities. For example, the ESP identified an aging mechanism in a stockpile high explosive, ultimately concluding that the changes actually improved the stability of the explosive. This assessment is permitting us to reuse the high explosive during the W87 life extension program, thus avoiding significant costs. We have also embarked on a novel strategy to accelerate the aging process in plutonium. The capability to predict the lifetime of components made from plutonium will permit us to more accurately identify when pit replacements are needed and when the significant facility investments must be made in order to support pit replacement.

Technical work on the W76/Mk4 Dual Revalidation Project drew to a close in December 1999. There were significant accomplishments in each of its major areas of investigation.

- ∃ System Level Assessment B The Military Characteristics and Stockpile to Target Sequence were reviewed and updated and the system was shown to meet requirements. The system also was assessed against safety requirements and for abnormal environments and successfully met them. Results from various tests are being used to validate new computational models, leading to an improved understanding that will be used for future assessments, evaluations and other analyses.
- ∃ Primary Physics Assessments B Five hydrodynamic tests were completed, four by Los Alamos National Laboratory and one by Lawrence Livermore National Laboratory. Two of the tests used stockpile-aged high explosives. A modern one point safety assessment was completed that reaffirmed the safety margin calculated in previous assessments. A modern intrinsic radiation analysis was performed. Significant progress was made in baselining.
- ∃ Secondary Physics Assessment B There is an improved understanding of the secondary. Significant progress was made in baselining and benchmarking of the secondary.
- ∃ Physics Package Engineering Assessment B A test of the ability of the secondary to withstand the revised long-term shipboard vibration environment was completed and the

results show it meets requirements. Extensive testing of the high explosive thermal sensitivity, chemical composition, and density properties was completed. An aged physics package was disassembled, inspected, and the aged components tested. A detailed description and catalogue of the function, composition, requirements, state, and design intent of each component was assembled.

- ∃ Arming Fuzing and Firing (AF&F) and Weapon Electrical System Assessment B
Nineteen AF&Fs were disassembled, inspected, and put through product acceptance testing. An age aware model of the fire set was completed and electronic sub-component models were developed. Most AF&F hostile environment testing is complete.

In addition to these specific accomplishments, the Dual Revalidation Project provided an opportunity to train many people within the DOE and DoD nuclear weapons communities. Engineers and scientists responsible for the system have developed in-depth experience. The project also provided significant contributions to the W76/Mk4 6.2/6.2A life extension study. The review team reports are scheduled to be submitted by the end of March 2000.

DOE has redirected the Dual Revalidation effort into baselining and peer review. The decision was made to baseline all the systems over the next five years while designers with underground test experience are still on the payroll. After the systems are baselined, we will assess any gaps discovered in our knowledge and develop a plan to fill them in.

MANUFACTURING CAPABILITIES

Manufacturing continues to play a critical role in the Stockpile Stewardship Program. During FY 1999, almost 1,300 Limited Life Components (LLCs) were produced. Plans call for the production of over 2,000 LLCs in FY 2000. These product deliveries signal the successful transfer of production activities from plants which have been closed. The weapons complex is also performing major refurbishment actions on several weapon types, including the B61 and the W87.

The W87 is a key component of the U.S. land based ballistic missile element of the U.S. nuclear deterrent triad. In December 1998, the Y-12 plant at Oak Ridge completed and shipped to Pantex the first refurbished canned sub-assembly for the life extension program of the W87 under our Stockpile Life Extension Program. Early in 1999, the first deliveries of electronic and mechanical parts for the W87 life extension were shipped to Pantex from the Kansas City plant. The first W87 life extension unit was delivered to the Air Force in May 1999. The W87 was the first production unit completed under the life extension program. This is considered a major milestone in meeting a DOE commitment made to the Air Force.

ADAPT

The Advanced Manufacturing, Design, and Production Technologies Campaign (ADAPT) is providing the nuclear weapons complex with advanced capabilities for: designing, developing, and certifying components and systems; and for producing, assembling, and delivering weapons components and products for systems. ADAPT is radically changing how DOE supports the nuclear weapons stockpile by infusing new product and process technologies, and by adopting state-of-the-art business and engineering practices. Our production complex must take advantage of modern design and manufacturing techniques to keep the complex vitally strong and capable under modern technology. We have now begun to use a paperless product realization system to quickly design and evaluate components prior to their release for production. Once released for production, the same paperless designs (computer models) are used to develop and drive manufacturing operations. This approach is already cutting costs and time while improving our ability to deliver extremely high quality parts. We have begun to use computer-based multimedia systems to guide production technicians on the shop floor and we expect to see quality improvements similar to those now being gained in U.S. industries using these methods, where manufacturing defects have been cut 60-90 percent. As an additional example, we are using models of the various operations in our production complex to identify and alleviate scheduling and operational bottlenecks. In one instance, we were able to remove a bottleneck in certain dismantlement operations, allowing us to cut in half, the time required to complete dismantlement of a warhead being removed from the stockpile with no compromise in safety and security.

We remain committed to exploring a robust and world-class microsystems engineering capability at Sandia National Laboratories. This effort could allow us to both develop and exploit emerging technologies that show great promise for miniaturizing weapon components, improving their reliability; and for maintaining a critical capability in radiation-hardened electronics needed to address potential safety, security, and hostile radiation threat environments of the future.

TRITIUM

Every U.S. nuclear weapon requires tritium to function as designed. Because tritium, a radioactive isotope of hydrogen, decays at a rate of 5.5 percent per year, it must be periodically replenished. DOE has not produced tritium since 1988 and the current START I inventory will be sufficient only until about 2005, after which the five year tritium reserve will be reduced and a new source of tritium will be needed.

In May 1999, the Department issued a Record of Decision that formalized the Secretary's December 1998 announcement that Tennessee Valley Authority (TVA) reactors would be used to produce tritium. That decision was codified in the National Defense Authorization Act for FY 2000.

Three TVA reactors—Watts Bar and both Sequoyah units—will be available to irradiate DOE

designed, commercially manufactured, tritium-producing rods. DOE plans to start production of tritium in TVA reactors beginning with the scheduled refueling of the Watts Bar reactor in October 2003. After irradiation, the rods will be shipped to the Savannah River Site where a new Tritium Extraction Facility is under construction. The facility will extract tritium gas from the rods and send it to the existing Tritium Loading Facility. Extraction operations are scheduled to begin in February 2006, later than originally planned because of the congressional restriction against tritium construction activities in FY 1999. Again, we have made up three months of this 12 month construction moratorium. The Tritium Extraction Facility's operating capacity will be such that the five year reserve will be fully replenished in two to three years.

An interagency agreement between DOE and TVA went into effect on January 1, 2000. TVA, with DOE assistance, is preparing requests to the Nuclear Regulatory Commission (NRC) to amend the licenses of the TVA reactors to permit tritium production. TVA plans to submit those requests at the beginning of calendar year 2001. The NRC review of the license amendment cannot begin until TVA has submitted its application for amendment of the operating licenses for Watts Bar and the two Sequoyah units. TVA will be putting that license amendment package together during the rest of calendar year 2000, with assistance from its two fuel vendors (Westinghouse and Framatone) and DOE. TVA corporate and plant licensing and engineering personnel will also be performing analyses and preparing significant portions of the license amendment submission. This work is on schedule.

Also during FY 2000, DOE will award a contract for commercial fabrication of 6,000 tritium-producing rods. Thirty-two rods underwent an irradiation demonstration in the Watts Bar reactor over the course of a full reactor operating cycle that was completed in March 1999. The rods have been taken to a DOE laboratory and are currently undergoing a series of examinations. So far, the results of all examinations have been as expected. Site preparation and detailed design of the Tritium Extraction Facility are in progress this year. In FY 2001, we will begin construction of the facility building.

The Record of Decision on tritium production stated that the Accelerator Production of Tritium (APT) alternative would be developed as a backup tritium technology by completing engineering development and preliminary design. With the success of the commercial light water reactor program and with competing financial demands on other parts of Stockpile Stewardship, DOE has been forced to redefine the work associated with the APT, the backup tritium technology. Consequently, we plan to work with Congress this year to suspend preliminary design work for an APT plant. However, engineering development and demonstration activities at LANL will continue to assure that, should the backup technology be needed, it will be ready. In addition, DOE will explore the potential for a multi-mission accelerator program that could include tritium production, isotope production, and waste transmutation.

EXPERIMENTAL PROGRAMS

It is at the DOE's Los Alamos, Sandia, and Lawrence Livermore National Laboratories and at the Nevada Test Site, that the science base of the Stockpile Stewardship Program is developed and applied. The experimental program is how, in the absence of nuclear testing, we divide the physics of the explosive sequence into each of its parts and analyze each separately. Information that we have from the production and surveillance activities described previously, helps us to focus our experiments. Information from over 1,000 U.S. nuclear tests also tells us where we need to fill in gaps in our knowledge through experiment and observation.

Thousands of experiments, large and small, are performed each year in support of stockpile stewardship. Subcritical experiments help us fill in gaps in empirical data on the high pressure behavior of plutonium, realistically bench marking data on the dynamic, non-nuclear behavior of components in today's stockpile; analyzing the effects of remanufacturing techniques; understanding the effects of aging materials; and addressing other technical issues. Information from these experiments will be key to qualifying the pit production capability at Los Alamos National Laboratory, as well as certifying the performance of weapons which will contain the replacement pits. These experiments also contribute significantly to the maintenance of the critical infrastructure and qualifications of skilled personnel at the Nevada Test Site to maintain readiness.

With the right tools, we can do a thorough job of investigating the first part of the nuclear explosion; that is, the implosion of the plutonium pit by high explosive, with non-nuclear experiments. We can measure a number of important features by taking X-ray pictures during critical parts of the experiment, and we can measure the time evolution of the implosion with arrays of contact sensors (called pins). We can then compare these pictures and time histories with calculations and with previous data from the more than 1,000 underground nuclear tests and 14,000 surveillance tests. Ultimately, we require better pictures at multiple times to certify rebuilt pits and 3-D simulations of weapon performance.

During FY1999, we conducted some 14 non-nuclear hydrotests at the Pulsed High Energy Radiographic Machine Emitting X-rays (PHERMEX) and related facilities at the Los Alamos National Laboratory; and about 15 tests at the Flash X-Ray (FXR) and B851 Site 300 facilities at the Lawrence Livermore National Laboratory. In addition, we conduct up to 1000 less complex experiments per year aimed at preparing for larger tests and subcritical experiments, and for understanding high-explosives behavior and explosive effects on materials. In FY 2000 and FY 2001, we anticipate conducting a similar number of experiments with major radiography shots, primarily at the Dual-Axis Radiographic Hydrodynamic Test (DARHT) Facility.

The DARHT facility at the Los Alamos National Laboratory, a massive, advanced X-ray facility, will examine an imploding pit model from two different directions at greatly improved resolution and will replace PHERMEX as the primary radiography machine at Los Alamos. The first axis of DARHT is now operational. In addition, under the auspices of the National Hydro Program, DARHT will perform some of the Livermore tests formerly done at the FXR machine located at LLNL. The building to house the second axis of DARHT is complete, and the accelerator is

under construction, due for completion in FY 2002.

The FXR firing site has been shut down since early FY 1999 for construction of the Contained Firing Facility which will be completed in FY 2001. FXR is currently being used for non-explosive, beam target development tests in support of the second axis of DARHT.

Experiments using the Los Alamos Neutron Science Center (LANSCE) are investigating proton radiography, a new technique in which proton beams from a linear accelerator are used directly in a novel approach to hydrodynamics-radiography that, if successful, could provide required additional information to our radiographic process of certifying pits. This technique is one of the candidate technologies being considered to make detailed, three-dimensional "motion pictures" of the implosion process. Smaller-scale dynamic proton radiography experiments have already been performed at LANSCE to address important certification issues (e.g., cold high-explosives performance), paving the way for validation of advanced explosives simulation models.

In 1998, the Z-pulsed power facility at Sandia achieved record X-ray energy and temperature levels. In 2001, we plan to conduct about 180 shots in Z in the areas of weapons effects, weapons physics, and ignition. A major activity at Z during FY 2001 will be the completion of installation of the beamlet laser from the Lawrence Livermore National Laboratory which will be used as a diagnostic on Z. This diagnostic will enhance investigations in all areas.

The Inertial Confinement Fusion Program, in conjunction with the other stewardship campaigns, is currently developing detailed experimental plans to achieve ignition and to address other stewardship issues during National Ignition Facility (NIF) operations.

Construction is underway for NIF, an essential element in the long-term success of the Stockpile Stewardship Program. NIF, the world's largest laser, will enable our scientists to generate conditions of temperature and pressure approaching those that occur in nuclear weapons. Demonstrations of how aged or changed materials could behave under these unique conditions will provide data essential to validate computer based predictions. Recently, laser glass has been produced which meets all required technical specifications. This is a major program accomplishment. All the enabling technologies required for construction of NIF have been demonstrated with the exception of coatings that will not incur damage at the laser energy levels required for ignition later in this decade. The NIF building is about 85 percent completed. The 10-meter diameter aluminum target chamber is installed in the building. The Optics Assembly Building to be used for final precision cleaning of the optical components which will be installed in the laser's beam path, and the Central Plant and its cooling towers, have been turned over to the laboratory for operation.

Integration, schedule and cost problems associated with the construction of the National Ignition Facility (NIF) were identified to DOE in late August of last year. On September 3, 1999, Secretary of Energy Richardson announced a series of actions to address these problems. In response, Defense Programs, DOE's Oakland Operations Office, the Lawrence Livermore

National Laboratory, and NIF project management have been working together to put the project back on track as directed by Secretary Richardson. The NIF project method of execution is being changed to address the increased complexity of this state-of-the-art system, and the cleanliness problems in assembling and installing the laser and target system infrastructure. As a result, assembly and installation of the beampath infrastructure system will now be managed and performed by industrial partners with proven records of constructing similarly complex facilities.

At the Secretary's direction, an independent task force was formed by the Secretary of Energy Advisory Board (SEAB) to review options to complete the project and to recommend the best technical course of action. The overall conclusion in the interim report to the SEAB stated, "The Task Force has not uncovered any technical or managerial obstacles that would, in principle, prevent the completion of the NIF laser system. Nevertheless, serious challenges and hurdles remain. The NIF Task Force believes, however, that with appropriate corrective actions, a strong management team, additional funds, an extension of the schedule and recognition that NIF is, at its core, a research and development project, the NIF laser system can be completed." The project is currently developing a new NIF baseline which will be certified by the Department and submitted to Congress as required. We will be working with the Lawrence Livermore National Laboratory management and internally within Defense Programs to get the project back on track. Your continued support of the NIF project, as a key element of the Stockpile Stewardship Program, is essential. The Secretary has committed to work closely with Congress on this issue.

SIMULATION AND COMPUTATION

Data from U.S. nuclear tests, experiments, surveillance, and production activities, provide input to the Stockpile Stewardship Program supercomputers. Sandia, Los Alamos and Lawrence Livermore National Laboratories are collaborating on the supercomputing program. While advanced computing has always been a feature of the nuclear weapons program, the computing speed, power and level of detail required to certify existing nuclear weapons without nuclear testing has required an extraordinary collaborative effort that is breaking barriers undreamed of only five years ago.

The Accelerated Strategic Computing Initiative (ASCI) is developing the high-performance computational modeling and numerical simulation capabilities necessary to integrate theory, existing data, and new experimental data to predict results that can be verified and validated. The ASCI program, a collaborative effort between the U.S. government and U.S. industry, is developing the world's fastest, most powerful computational and advanced simulation and modeling capabilities. These advanced supercomputers are needed to fully implement science-based methods and to assess and certify the safety, security, and reliability of the stockpile without underground nuclear testing.

Advanced computational capabilities that include application codes, computing platforms, and various tools and techniques, are being developed under ASCI and incorporated into ongoing stockpile computational activities. This technology is being developed at about twice the rate of commercial computing speed and power advances. ASCI has been highly successful in meeting its milestones and providing effective new tools to support Stockpile Stewardship. Information developed from other elements of the Stockpile Stewardship Program, such as NIF and our subcritical experiments, will provide the basic physics models and data for ASCI simulations.

At the end of FY 1998, ASCI unveiled its second generation of computing systems. Two major systems capable of running in excess of three trillion operations per second (3 TeraOps) peak speed were delivered ahead of schedule and within budget. Blue Pacific, developed by IBM, is located at the Lawrence Livermore National Laboratory (LLNL), and Blue Mountain, developed by SGI, is located at the Los Alamos National Laboratory (LANL). These systems are each 15,000 times faster and have roughly 80,000 times the memory of the average personal desktop computer. Under the Blue Pacific program, a world record 1.2 TeraOPS was achieved on a hydrodynamics benchmark while a second benchmark run set a world record with 70.8 billion zones.

On February 12, 1998, the Department announced the selection of IBM to partner with ASCI on the Option White 10 TeraOps supercomputer to be located at LLNL. Building upon the experience and knowledge gained with the 3 TeraOps Blue Mountain system, LANL is procuring a computational system that will achieve a peak performance level of 30 TeraOps by mid-year 2001. And the Department's first generation Option Red Intel computer system, installed at the Sandia National Laboratories in 1996, has been upgraded with faster processors and more memory and is now operating in production mode at a peak speed of more than 3 TeraOps.

The ASCI Defense Applications and Modeling Campaign has recently completed the first three-dimensional simulation of a nuclear weapon primary explosion and has compared the results with the data from an underground test. This calculation, an important first step toward simulating a complete nuclear weapon, was performed by the Lawrence Livermore National Laboratory during December 1999.

Completion of the prototype ASCI burn code required to perform the above calculation was the first of an ambitious series of mileposts required to achieve a high-fidelity simulation of a full nuclear weapon system by 2004. The code team at LLNL met this very difficult milepost on schedule and with code capabilities that exceeded the established programmatic specifications. Future mileposts require a continued effort to extend this calculation to nuclear weapons secondaries and later to full weapons systems. At the same time, other mileposts address the advanced physics and materials models that will be required to achieve the highly accurate simulations that are needed in the absence of underground nuclear tests.

Weapons designers are already utilizing these new three-dimensional codes and the ASCI computer systems to support assessment of the stockpile. They have run simulations to support

the certifications of the B61 modification and the W76 neutron generator. These simulations would not have been possible without the capability provided by the ASCI platforms performing at the TeraOps level. However, three-dimensional, high-fidelity simulation of a full weapon system and its performance, as defined by scientists and engineers at DOE national laboratories, will require a minimum of 100 TeraOps of computing capability.

The unprecedented computational power of ASCI is also being made available to selected groups in the university community through the Academic Strategic Alliances Program. In 1997, the Department awarded contracts to five major U.S. universities--Stanford University, California Institute of Technology, the University of Chicago, the University of Utah, and the University of Illinois. The work of the university teams is of similar difficulty and complexity to that needed for Stockpile Stewardship and will provide benchmarks by which we can assess the accuracy of our own work. These projects are expected to lead to major advances in computer simulation technologies as well as to discoveries in basic and applied science, areas important to ASCI, the broader Stockpile Stewardship Program, and other application areas. Applications being developed and run by the university teams are unclassified and deal with significant non-defense scientific priorities.

TECHNOLOGY PARTNERSHIPS PROGRAMS

The Defense Programs Technology Partnerships Program, which has been restructured and directly integrated into Stockpile Stewardship activities, represents an important investment in near-term and future capabilities. The private sector has technical leadership in many areas that are critical to the nuclear weapons program. The Technology Partnership Program sponsored collaborations between the national laboratories, plants and industry are contributing to all components of the Stockpile Stewardship Program. Developing these collaborations has been challenging but there are a number of successes. For example, a partnership between Sandia National Laboratories (SNL) and General Electric has improved SNL's capability in the production of neutron generators, a critical weapons component. Another example is the Los Alamos National Laboratory collaborations with Dow Chemical and PPG on predictive modeling of materials aging. The ability to accurately predict material lifetimes and reliability has paramount consequences for the Nuclear Weapons Stockpile Stewardship Program and for major industrial challenges like aging effects on an array of materials from car frames and engine parts to medical implants. Measured progress in these partnerships remains beneficial to Stockpile Stewardship and to other national concerns.

BUDGET SUMMARY FOR FY 2001

Weapons Activities Account Summary

(dollars in thousands)

	<u>FY 1999 Current Appropriati on</u>	<u>FY 2000 Current Appropriati on</u>	<u>FY 2000 Comparabl e Appropriati on</u>	<u>FY 2001 Reques t</u>	<u>Compara ble Change %</u>
Operations & Maintenance..	3,899,601	3,904,464	3,798,654	4,179,827	10.0%
FY 2000 Supplemental.....	0	55,000	55,000	0	-100.0%
PY Work conducted in FY99	<u>28,558</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0.0%</u>
Subtotal O&M	3,928,159	3,959,464	3,853,654	4,179,827	8.5%
Construction.....	<u>518,984</u>	<u>530,256</u>	<u>530,256</u>	<u>414,173</u>	<u>-21.9%</u>
Subtotal, Weapons Activities.....	4,447,143	4,489,720	4,383,910	4,594,000	4.8%
Use of PY Balances...	-50,994	-7,668	-7,668	0	-100.0%
Less Proposed Supplemental	<u>0</u>	<u>-55,000</u>	<u>-55,000</u>	<u>0</u>	<u>-100.0%</u>
Total Weapons Activities.....	4,396,149	4,427,052	4,321,242	4,594,000	6.3%

The FY 2001 Operations and Maintenance (O&M) request increases 8.5 percent above the comparable FY 2000 appropriated level, including the pending supplemental request. The supplemental request is a result of recommendations in the 30 Day Review which highlighted FY 2000 budget pressures caused by increased security requirements and issues that have emerged since the FY 2000 Congressional budget was submitted. The \$55 million would provide additional funding to address critical skills retention and other issues at the Y-12, Kansas City and Pantex plants, and

would continue activities necessary to restart enriched uranium operations at Y-12.

The construction request is about 22 percent below the FY 2000 request level, reflecting programmed decreases in appropriations for major projects, including the National Ignition Facility (NIF) and the Dual Axis Radiographic Hydrodynamic Testing Facility (DARHT), and completion of funding for six projects. The request level supports a continuing program of infrastructure renewal at the laboratories, as well as the start of construction for three key new experimental and manufacturing facilities.

Decision Unit Summary

(dollars in millions)

	<u>FY 1999 Current Appropriation</u>	<u>FY 2000 Current Appropriation</u>	<u>FY 2000 Comparable Appropriation</u>	<u>FY 2001 Congressiona l Request</u>	<u>Comparable Change</u>
Stockpile Stewardship	2,113.1	2,200.6	0.0	0.0	0.0%
Stockpile Management	2,055.4	¹ 1,991.8	0.0	0.0	0.0%
PY Work conducted in FY99	28.6	0.0	0.0	0.0	0.0%
Stockpile Stewardship O&M					
Directed Stockpile Work	0.0	0.0	760.0	836.6	10.1%
Campaigns	0.0	0.0	928.6	1,049.9	13.1%
Readiness in Tech Base	<u>0.0</u>	<u>0.0</u>	<u>1,870.0</u>	<u>1,953.6</u>	<u>4.5%</u>
Subtotal	0.0	0.0	3,558.6	3,840.1	7.9%
Secure Transportation Asset .	0.0	91.5	91.5	115.7	26.5%
Program Direction	250.0	205.8	203.6	224.1	10.1%
Construction	<u>0.0</u>	<u>0.0</u>	<u>530.3</u>	<u>414.2</u>	<u>-21.9%</u>
Subtotal	4,447.1	4,489.7	4,383.9	4,594.0	4.8%
Use of Prior Yr Balances	-51.0	-7.7	-7.7	0.0	-100.0%
Less Proposed Supplemental	<u>0.0</u>	<u>-55.0</u>	<u>-55.0</u>	<u>0.0</u>	<u>-100.0%</u>
Total, Weapons Activities	<u>4,396.1</u>	<u>4,427.0</u>	<u>4,321.2</u>	<u>4,594.0</u>	<u>6.3%</u>
Federal Staffing	1,777	1,751	1,751	1,787	2.1%
DP-Funded M&O ²	22,739	21,582	22,625	22,570	-0.2%

¹ Includes \$55 million proposed supplemental funding.

² FY 1999 End of Year; FY 2000 and FY 2001 projections are averages for labs and headcounts for plants.

The FY 2001 budget request supports the transition to performance-based program management and budgeting for the Stockpile Stewardship Program. The overall increase in FY 2001 will cover: inflationary increases; support current infrastructure; and does not anticipate involuntary layoffs at the laboratories, Nevada Test Site, or production plants at this time. We have protected our highest priority work associated with pit aging issues, surety improvements, and stockpile support activities.

Stewardship O&M provides funding for activities carried out by integrated contractors encompassing

Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities; principally at the Lawrence Livermore, Los Alamos and Sandia National Laboratories, production facilities at Kansas City, Pantex, Savannah River and Y-12, and the Nevada Test Site. The program activities link directly with DP=s performance goals and objectives in the Strategic Plan. They provide the technical basis for confidence in the safety, reliability, and performance of the U.S. weapons stockpile in the absence of underground nuclear testing. The programs have been balanced to develop and maintain essential scientific and technical capabilities over the long-term while meeting near-term workload requirements and schedules, within a modern integrated complex with unique and interdependent facilities. On a comparable basis, the FY 2001 request for Stewardship O&M activities is approximately 7.9 percent above the FY 2000 request, including the pending FY 2000 supplemental.

Directed Stockpile Workload increases 10.1 percent in FY 2001. Production schedules for gas generators, neutron generators and tritium reservoirs in the Master Nuclear Schedule, Volume II, are met. Alteration and modification schedules as specified in the Production and Planning Directive, principally focused on the W87 Life Extension Program, schedules are supported. Although we will be working with the DoD to relax certain outyear schedules, critical near-term stockpile needs are supported. Limited full scale engineering development continues in support of the W80 and W76, although we are interested in exploring less complex, lower cost workload options with the DoD. We are studying the potential transfer of the work on the W80 from the Los Alamos National Laboratory to the Lawrence Livermore National Laboratory as a longer-term workload leveling measure. Pit manufacturing and certification efforts for the W88 continue.

The Campaigns increase \$121.3 million, or 13.1 percent above the FY 2000 comparable level of \$928.6 million, to support the development of the tools and scientific capabilities required to maintain and certify the nuclear stockpile without underground nuclear testing into the future. The budget request allocates significant program growth over FY 2000 to the highest priorities: supporting campaign activities and key milestones in Pit Manufacturing Readiness (+54% growth); Primary Certification (+41% growth); Enhanced Surveillance (+21% growth); and ICF and High Yield (+21% growth). Program growth in the 10 to 20 percent range is allocated in the Secondary Certification, Advanced Radiography, and Certification in Hostile Environments campaigns.

Pit Manufacturing Readiness, which increases \$38.1 million, or 54 percent above the FY 2000 comparable level, will focus on continuing the manufacture of development pits leading towards the manufacture of a certifiable W88 pit. Increased funding will support the hiring of production staffing and the procurement and installation of reliability equipment. Subsequent to FY 2001, activities will move from manufacturing development pits to steady state manufacture of pits for qualification and production pits for placement into the stockpile.

Primary Certification, which increases \$11.9 million, or 41 percent above the FY 2000 comparable level, performs increasingly complex integrated hydrodynamic radiography and subcritical experiments for development of simulation codes and weapon certification.

Enhanced Surveillance, which increases \$15.6 million, or 21 percent above the FY 2000 comparable level, will include a pit study to determine whether pit lifetimes equal or exceed 60 years (enabling substantial deferral or downsizing of a potential new pit manufacturing facility) and the development and implementation of new, non-destructive examination tools for early detection of potential flaws.

Inertial Confinement Fusion Ignition and High Yield, which increases \$21.1 million, or 21 percent above the FY 2000 comparable level, will support the design and development of the NIF Cryogenic System, the development of the initial set of core target diagnostics and laser characterization diagnostics for NIF, ignition target design, development and experiments to verify conditions necessary for ignition, weapons physics experiments which also support other Stewardship campaigns.

Secondary Certification and Nuclear Systems Margins, which increases \$8.6 million, or 19 percent above the FY 2000 comparable level, will support design of above ground experiments to examine HE-induced case dynamics and performance issues required for code validation and to enhance capabilities in hydrodynamic modeling.

Advanced Radiography, which increases \$5.1 million, or 14 percent above the FY 2000 comparable level, optimizes the first axis beam on DARHT which became operational in FY 1999. Research and development will be conducted to begin to define the requirements for advanced radiography capabilities to support certification of refurbished and replaced primaries.

Certification in Hostile Environments, which increases \$1.6 million, or 12 percent above the FY 2000 comparable level, will allow us to start the development of System Generated Electromagnetic Pulse model validation for the ASCI codes to support the W76 Arming Firing and Fusing (AF&F) certification, to work on 0.5 Fm rad/hard (silicon-on-insulator) technologies for the W76 and future AF&F refurbishments , and to accelerate the calculations of weapons outputs.

We are maintaining progress on achieving an assured source of tritium, although we are suspending the efforts on the preliminary design for the backup Accelerator Production of Tritium plant. We are developing advanced stewardship tools, particularly simulation and modeling, the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility, 3D burn codes, and subcritical experiments. These activities are essential to maintain confidence in the safety of the stockpile without underground nuclear testing to assure that the U.S. will continue to certify the effectiveness of the nuclear weapon stockpile into the future.

Within the Readiness in Technical Base and Facilities decision unit, the largest category supporting operations of facilities is essentially flat from the FY 2000 level. There is significant growth over FY 2000 in other categories such as Containers, Program Readiness, and Advanced Simulation and Computing.

Advanced Simulation and Computing increase \$80 million, about 20 percent, including: \$3.9 million to accommodate final development and delivery of 10 TeraOps system and ongoing operating

expenses for the 3 TeraOps (LANL and SNL) systems; \$8.7 million for Distance and Distributed Computing (DisCom²) efforts to scale up software development and network bandwidth substantially in order to enable tri-lab use of the 10 TeraOps platform under demanding conditions; \$45.1 million for Visual Interactive Environment for Weapons Simulation (VIEWS) for integrating visualization and data management and developing technologies that contribute to the Asee and understand capabilities for 3D simulation codes data with increased levels of fidelity and for new computing and display equipment and software development to use scalable parallel technologies and, \$13.0 million for Collaborations with University Partners, Alliances, Institutes and Fellowships for existing commitments and expansion of the program along with continued development of partnerships with expertise in academia.

The Department's Secure Transportation Asset is requesting a funding increase of 26.5 percent over FY 2000 to support its plan to continue to redress security and other vulnerabilities identified in recent Departmental evaluations, including the replacement of safe secure transporters (SST's) with the next generation SafeGuards transporters, equipment and escort vehicle upgrades, recruitment of new courier classes, and enhanced inservice training.

Defense Programs is requesting an increase in Program Direction funding of \$20.5 million, a 10.1% percent increase over the FY 2000 appropriation. The largest portion of this increase, \$11.0 million, is to cover the DP federal staff's salaries and benefits. This increase covers expected cost of living increases, step increases, promotions, and full year funding for the 30 new hires to be brought on-board during FY 2000 at headquarters as part of the Secretary's Workforce 21 initiative to fill critical mission skill positions. The request supports the Secretarial Scientific Retention and Recruiting initiative to enhance scientific and technical talent in the federal workforce, and provides flexibility to relocate staff and consolidate functions among headquarters, operations office and area offices in FY 2001.

Construction includes all DP-funded, line item infrastructure and programmatic construction projects at the laboratories, Nevada Test Site, and plants. The construction request is about 22 percent below the FY 2000 level. This reduction reflects the completion of appropriations for six projects, and planned decreases for three more, including the National Ignition Facility (NIF) and DARHT experimental facilities that are progressing towards completion. Three new starts are also proposed: the Distributed Information Systems Lab at the Sandia National Laboratory in California; Highly Enriched Uranium Storage Facility at Y-12; and Weapon Evaluation Testing Laboratory at Pantex; and in addition, Defense Programs is piloting the Departmental initiative to request "Preliminary Project Design and Engineering" funding for potential out year new construction starts. This pilot project is intended to remedy problems in construction projects related to inadequate scope definition and premature cost estimates. Construction funds included in the FY 2000 request for NIF do not reflect forthcoming cost and schedule changes..

CONCLUSION

Stockpile Stewardship is a one-of-a-kind endeavor. It is unique in that we are responsible for a product that everyone hopes we will never have to use. It is unique in the same way that the Manhattan Project and Apollo moon program were: innovative, creative approaches to something new under the sun with no margin for error. It is unique in that we are not making any new weapons, but are only maintaining existing inventory. We must continue both to maintain current models without total system testing, but also be prepared to return to design, production and testing if directed to do so by the President. Every year, our success on the job must be certified to the President. Our responsibilities and capabilities are often the focus of heated public debate and occupy a singular position in the formulation of foreign and defense policy.

On the other hand, Stockpile Stewardship involves many industrial processes common to private industry. We must be sure that product replacement parts continue to be available and that new materials and processes are compatible with maintaining our existing inventory in perfect working order without underground nuclear testing. To get the job done right, we rely on advanced scientific expertise, complex experimental capabilities, historic product data, and highly sophisticated computer calculations -- bottom line -- more high tech than almost any other organization. We have high level security and safety concerns, transportation needs, environmental responsibilities, downsizing requirements, workforce and training issues, cost-benefit trade-offs to consider, and other problems similar to those faced by private businesses, although in a unique context. And, as is usually the case in any business or government activity, our people remain the key to our success now and in the future.

Properly supported and carefully managed, I believe the Stockpile Stewardship program will continue to maintain, indefinitely, a safe and reliable stockpile without the need to conduct nuclear testing. I know of no other national security issue more important for our nation in this new millennium of great challenges.