

**Statement of Dr. John R. Harvey
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**Fiscal Year 2014 Budget Request for
Atomic Energy Defense Activities and Nuclear Forces Programs**

**Before the
Strategic Forces Subcommittee
Committee on Armed Services
U.S. House of Representatives**

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Introduction

Chairman Rogers, Ranking Member Cooper, and members of the Subcommittee: I am pleased to testify before you today regarding progress on implementing the Nuclear Posture Review including plans to sustain and modernize our nuclear stockpile and supporting infrastructure, our nuclear delivery platforms, and the command and control system that links nuclear forces with Presidential authority. I will also briefly address the effectiveness of the Departments of Defense (DoD) and Energy (DOE) in pursuing the joint work of the Nuclear Weapons Council (NWC) in ensuring a safe, secure, and effective nuclear stockpile.

I currently serve as Principal Deputy Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (NCB) in the Department's Acquisition, Technology and Logistics (AT&L) organization. Andrew Weber, the Assistant Secretary of Defense (NCB), is the NWC staff director. Frank Kendall, the Under Secretary of Defense (AT&L), chairs the NWC. Within DoD, AT&L/NCB is the principal point of contact for all engagement with the DOE on U.S. nuclear weapons programs. AT&L also oversees DoD acquisition programs to sustain and modernize nuclear delivery systems and systems for their command and control.

U.S. nuclear modernization programs are embedded in an increasingly austere budget environment. The Budget Control Act, previous Appropriations marks, and cost growth in key DOE programs have forced adjustments to some planned modernization and recapitalization efforts. Future cuts from sequestration may affect the modernization programs addressed at this hearing. Not all that we desire in modernization can be achieved on the schedules originally planned—this conclusion is common to both Departments. Our best strategy, therefore, is solid, cost-effective implementation of high-priority programs that address the long-term health of the nuclear enterprise. That strategy is reflected in the President's FY 2014 request for nuclear weapons activities—therefore, congressional support for the request is essential

Nuclear Weapons Stockpile

Today our nuclear weapons stockpile is the smallest since the Eisenhower administration, but its role in deterring the most grievous of threats to our nation and its allies remains central. The President's FY 2014 request for the core NNSA weapons program is \$5.1 billion, or \$466 million above the FY 2013 continuing resolution level, constituting a 7.5 percent increase in

funding. This level of funding shows the President's commitment to the programs and capabilities essential to DoD's strategic deterrence mission. In addition, the FY 2014 request will enable important progress on a modern, robust nuclear infrastructure that will provide the United States with capabilities to address technical problems in the stockpile, or respond to future geopolitical challenges, with a substantially smaller stockpile than we have today. It would:

- Continue needed production of the life-extended W76-1 SLBM warhead,
- Advance the ongoing Life Extension Program (LEP) for the B61 bomb,
- Advance the W78/88-1 study exploring the feasibility for an interoperable ICBM/SLBM warhead,
- Sustain warhead surveillance efforts, and the science and technology that support stockpile assessment and certification in the absence of underground nuclear testing,
- Replace an aging facility for HEU operations at the Y-12 plant in Oak Ridge with a modern Uranium Processing Facility (UPF).

Budget realities, coupled with large cost escalation for the B61 LEP and for recapitalization of aging infrastructure, have forced adjustments in NNSA's programs. Core elements of the nuclear complex, and critical military requirements, are funded but completion of certain LEPs and infrastructure modernization will be delayed. Among other things, NNSA is deferring construction of a plutonium facility at Los Alamos—the Chemistry and Metallurgy Research Replacement-Nuclear Facility (CMRR–NF)—for at least five years.¹

CMRR–NF deferral frees up funds to place the UPF construction project at Y-12 on a more optimal funding profile, resulting in reduced life cycle cost and reduced risk to ongoing highly enriched uranium operations at antiquated existing facilities. At the same time, it provides flexibility to advance critical warhead LEPs for the W76-1 warhead, the B61-12 bomb, and the W78/88-1 interoperable warhead. Deferral, however, poses some risk to meeting pit manufacture needs for future LEPs and other contingencies; our strategy to mitigate this risk is described below.

Plutonium Strategy

Pit production capacity ramping up to 80 pits per year by the latter part of the next decade may be necessary according to current NWC projections. To achieve this capacity, we must replace the aging and increasingly unsupportable Chemistry and Metallurgy Research facility, currently supporting plutonium pit manufacture carried out at Los Alamos National Laboratory's Plutonium Facility-4 (PF-4). While CMRR–NF deferral from 2023 to at least 2028 delays initial operations of a long-term plutonium infrastructure, it also provides an important opportunity. Because the acquisition timeline for CMRR now overlaps the timeline to recapitalize the PF-4 facility, which is also aging, there is flexibility to explore an integrated and potentially more responsive approach to moving forward on the suite of support capabilities planned for CMRR and to managing long-term pit manufacturing and related infrastructure. To secure the fiscal

¹ The Chemistry and Metallurgy Research Replacement facility would store plutonium parts and provide lab space for plutonium R&D, analytical chemistry, and materials characterization in support of pit production.

benefits and manage the risks of deferral, the NWC is advancing a plutonium strategy with two key components.

First, we are exploring a concept that would provide the essential capabilities planned for CMRR, and also address PF-4 aging, with a phased, more responsive, and more readily implementable approach. The “modular concept” entails construction of a series of smaller, single-purpose (e.g., plutonium casting) modules linked together through secure tunnels with PF-4 and the existing plutonium radiological/analytical facility. The concept would provide means to transfer higher operational risk activities out of PF-4, thereby extending its operational life while enabling production capacity enhancements and sufficient analytical support to production. Over the next two months, the NWC staff, with support from DoD’s Cost Assessment and Program Evaluation (CAPE) organization, will work with NNSA to carry out a business case analysis of this concept (and alternatives), address risks and benefits, pros and cons, and seek initial insights into whether delivery of key capabilities could be achieved earlier than planned for CMRR-NF. If deemed feasible, NNSA would then develop a plan to move forward on engineering development and construction of the modular approach.

Second, to manage risk in the interim, we have identified a near-term option to enable a more rapid response to technical problems in the stockpile or geopolitical challenges. This involves the reuse of existing pits in LEPs, supplemented by a capability to manufacture existing IHE pit designs at a rate of 30 per year by 2021. To achieve this interim goal, existing facilities will be adapted and new equipment procured. Congressional approval of NNSA’s request to reprogram \$120 million in FY 2012 funds is critical to efforts to achieve this interim capability while avoiding greater risks to the stockpile. We urge your support for this request.

Other Nuclear Modernization Activities

The 2010 Nuclear Posture Review concluded the United States will retain a nuclear triad under a New START Treaty composed of ICBMs, SLBMs, and nuclear-capable heavy bombers. The budget submitted to Congress in April, as it has over the past four years, reflects this.

Submarine-Based Nuclear Forces

Sustaining the sea-based leg of our nuclear deterrent, the most survivable leg, is vital particularly as we move to lower numbers. Under New START, Ohio class submarines carrying Trident D-5 SLBMs will compose the majority of the nation’s operationally deployed nuclear warheads, increasing the nation’s reliance on the sea-based leg. Existing Ohio class submarines will begin retiring in 2027. As a result, the Navy is moving out aggressively on an Ohio Replacement submarine with construction of the first boat to begin in 2021. Twelve new boats are planned for purchase with the first boat scheduled to begin patrol in 2031. Careful management of fleet operations is essential to ensuring that existing submarines, which have already been extended 12 years beyond original design life, do not age out before replacement boats come on line. The Navy also has a program underway to extend the service life of the current D-5 missile—including launcher, navigation, fire control, guidance, stages and reentry systems—to match the Ohio submarine service life, and to serve as the initial baseline SLBM for the Ohio Replacement submarine. All DoD sustainment and modernization efforts for the submarine-based deterrent are fully funded in the President’s FY 2014–2018 request—about \$27 billion over the five years.

ICBMs

The Air Force plans to sustain the existing Minuteman III (MMIII) ICBM system through 2030. To achieve this, activities are underway to address emerging needs in the areas of solid rocket motor propulsion, guidance system upgrades and fuze refurbishment. Ongoing intensive flight test and surveillance efforts will help determine whether service life can indeed be extended to 2030 by providing better estimates for component age-out and system end of life. An Air Force Capabilities Based Assessment examining initial requirements and capabilities for a follow-on system to MMIII—termed Ground Based Strategic Deterrence (GBSD)—was completed last August and approved by the AF Chief of Staff. An analysis of alternatives (AOA) will begin this summer to examine specific GBSD options and be completed late in FY14. The AOA will inform near-term MMIII recapitalization programs so that technologies and components can be leveraged for GBSD. A solid rocket motor development program that could support GBSD or, potentially, a follow-on MMIII life extension, is planned to begin in 2016.

W78/88-1 Warhead LEP

The W78 warhead for the Minuteman III ICBM entered the stockpile in 1979. By 2021, it will have been deployed for over 40 years—well beyond initial estimates of its service life. A feasibility and cost study began in 2012 to explore warhead life extension options to ensure that this weapon system can continue its nuclear deterrence mission into the 2020s. As called for in the 2010 NPR, the study is exploring an option for an interoperable ICBM/SLBM warhead. The original military specifications of the W78, approved in 1974, identified this goal but the technology to achieve it was not available then. We believe it is now. This approach is timely because the W88 warhead for the D-5 SLBM is aging and work on its life extension must begin within a decade. There is an opportunity to reduce overall life-cycle costs with a single warhead development program that could meet the life extension objectives of two different warheads. Consistent with the President's long-term vision, there is also opportunity to reduce further the number of warhead types, and the number of reserve warheads in the stockpile needed to hedge against unforeseen technical or geopolitical risk. The study underway, co-led by the Air Force, Navy, and NNSA will produce a feasibility analysis and detailed cost estimates for options under consideration to inform a subsequent decision to enter engineering development. Ongoing efforts among NNSA, the Air Force and Navy to develop common components for ICBM and SLBM warhead arming, fuzing and firing systems will be leveraged. The W78/88-1 LEP provides a unique opportunity to extend W78 and W88 service life with a warhead that incorporates modern safety, security, and control features, and offers potential for reduced life cycle costs and a smaller stockpile.

Strategic Bombers

The U.S. will maintain two B-52H wings and one B-2 wing. Both bombers, however, are aging and sustained funding and support are required to ensure operational effectiveness through the remainder of their service lives. Funding has been allocated to upgrade these platforms; for example, by providing the B-2 with survivable VLF/LF communications, an upgraded defensive management system, and modifications that will permit carriage of advanced digital weapons such as the B61-12 and the Long Range Standoff (LRSO) missile. EHF satellite communications capabilities for both the B-2 and B-52H will be delayed because of increased

focus, in the near term, in providing Family of Advanced Beyond-line-of-sight Terminals (FAB-T) EHF terminals to essential ground and air-based command and control nodes. Fielding FAB-T on bombers, a more technically difficult challenge, will follow. The President's Budget includes \$14 billion over the next five years to sustain and modernize the B-52H and B-2.

Despite continued investments in sustaining existing bombers, over time the ability of these platforms to prevail against increasingly sophisticated defenses will continue to diminish. As a result, the Department is moving out on a program for a new, long-range, nuclear-capable, penetrating bomber—termed the Long Range Strike-Bomber (LRS-B)—that is fully integrated with a family of supporting aircraft (e.g., for electronic warfare and long-range air defense) and ISR assets. The plan is to purchase 80-100 bombers. As part of this effort, essential components of the bomber industrial base, such as low observable technology, are being sustained with technology maturation efforts. The FY 2014–2018 request includes \$8.8 billion for the new bomber development program—a significant increase from last year's plan.

Strategic Cruise Missile

Bomber standoff capabilities are essential to strategic deterrence, and they assure our Allies of our extended deterrence commitment. Modern air defenses put the bomber standoff mission with Air Launched Cruise Missile (ALCM)—the current strategic cruise missile deployed with the B-52H bomber—increasingly at risk. The Air Force recently completed an AOA for an ALCM follow on system called the Long Range Standoff (LRSO) missile. The President has requested \$1 billion over the next five years for LRSO development—this reflects a substantial increase from last year (\$600 million over FY 2013–17) and reflects planned transition from studies to system design and engineering development. The LRSO missile will be compatible with the B-52H, B-2, and LRS-B. The Air Force is collaborating with DOE to study options for a life-extended warhead for LRSO; options include the existing W80 ALCM warhead, the W84 warhead previously deployed with the ground-launched cruise missile, and the warhead for the B61 bomb, which is currently undergoing life extension. Plans are to sustain the existing ALCM and its W80 warhead until the LRSO missile can be fielded.

Dual Capable Aircraft (DCA)

To provide an option to continue the U.S. nuclear presence in Europe, a nuclear capability will be provided to the Joint Strike Fighter (JSF), which is replacing aging F-16 aircraft. The original plan was to deliver a dual capable JSF in 2017; however, the fielding of this capability has been delayed. The Air Force now intends to deliver nuclear capability to all JSFs in Europe by 2024 via the Block IV upgrade. The Air Force is developing options to ensure no gap exists in our ability to meet extended deterrence commitments to allies. This includes possible service life extension of existing DCA, and making sure that the life-extended B61 bomb is compatible with those aircraft.

B61-12 Bomb LEP and Tail Kit

The B61 non-strategic bombs deployed with NATO DCA are an important part of our extended deterrence commitment to the Alliance. The B61 strategic bomb, carried by the B-2 bomber, is an essential component of air-delivered strategic deterrence. The B61 is the oldest warhead design in the U.S. nuclear stockpile with components dating from the 1960s (e.g., vacuum tube radars, analog circuitry) and other limited life components (neutron generators, power sources),

all reaching the end of service life. A joint Air Force-NNSA LEP for the B61 has entered engineering development; test and analysis of the selected design option are underway. NNSA has initiated process development activities to optimize the use of limited NNSA production capacity and ensure component producibility. A single warhead—termed the B61-12—will replace four (one strategic and three non-strategic) types of the B61, and thus reduce the number of warhead types in the U.S. arsenal. As a result, the LEP will provide a safer, more reliable bomb with reduced sustainment costs. Initial production for the B61-12 no later than FY 2019 is essential to manage risk associated with component end of life. We are acutely aware of the high cost of the B61-12 LEP; increased management attention is essential to controlling costs.

In parallel to the LEP, the Air Force is developing a tail kit assembly for the B61-12 that will provide a modest standoff capability, for safe aircraft escape, and sufficient delivery accuracy so that the lower yield of the B61-12 can achieve the same military effect as the original B61. The tail kit eliminates the existing parachute, freeing up additional design space (i.e., weight and volume) to enable assured, long-term warhead reliability and potentially enhanced warhead surety. A tail kit prime contractor was selected in November 2012, and the program is entering engineering and manufacturing development. The total cost of the Air Force Tail Kit program is about \$1.6 billion. NNSA and the Air Force are synchronizing work on the bomb and tail kit assembly to ensure that the capability is delivered in time to meet operational requirements.

Solid Rocket Motor (SRM) Industrial Base

An important strategic modernization issue is sustainment of the large-diameter solid rocket motor industrial base particularly in light of reduced demand from NASA after completing the space shuttle program. A small-scale AF program to maintain a “warm” production line for MMIII solid rocket motors was completed in FY 2012. The Navy is maintaining continuous production capability at a minimum sustaining rate of twelve solid rocket motor sets per year. In FY 2013, the Air Force will spend \$8 million to examine technical expertise needs and develop affordable options for a follow on solid rocket motor modernization, referred to earlier, that will begin in FY 2016. Propulsion technologies developed and matured within the ICBM Demonstration and Validation Propulsion Applications Program (PAP)—funded at about \$40 million per year—will be available for use in that program.

Physical Security

The July 2012 protestor incursion at DOE’s Y-12 facility highlighted the need for continued collaboration between the two Departments to address physical security of nuclear warheads and associated fissile materials. DoD nuclear security professionals were fully integrated into the Y-12 after action reviews and best practice/lesson-learned assessments. The interagency perspective proved beneficial to both Departments as events were dissected. We continue to implement Deputy Secretary guidance to pursue a collaborative approach to nuclear security. We have incorporated NNSA experts into our force-on-force exercises and modeling and simulation efforts. Our goal remains consistent protection standards for nuclear weapons and weapons-usable materials.

Nuclear Command, Control, and Communications (NC3)

An often underappreciated but critical component of strategic deterrence is the nuclear command and control system that links the triad of nuclear forces with the President. Independent of the number of delivery systems and warheads deployed, we require robust, secure, survivable, and

effective systems for early warning, attack assessment, and force direction in support of existing nuclear employment plans and associated contingencies. Positive control of nuclear forces must be assured even under the enormous stress of a nuclear crisis. An effective NC3 system will:

- Clearly and unambiguously detect and characterize an attack;
- Support senior leader conferencing to assess the attack and determine an appropriate and timely response;
- Disseminate emergency action messages to nuclear forces taking into account the survivability of the force elements involved;
- Provide two-way communication with forces so executed; in the case of bombers for their recall before a strike, or for damage assessment after a strike; and
- Provide enduring control of surviving forces.

In fielding NC3 systems, we rely on a discipline grounded in certain key principles including dual phenomenology (both infrared sensor and radar detection) for ballistic missile early warning and threat assessment, redundant communications links, and hardening of systems to nuclear environments. Over the five-year period of the President's request, we will spend \$18 billion on NC3 system RDT&E, procurement, operations, and support to address the following needs:

- Survivable satellite communications (evolution of Defense Satellite Communications System/MILSTAR to Advanced Extremely High Frequency)
- Survivable communications to forces (B-2 LF/VLF, FAB-T EHF terminals, Minuteman MEECN Program Update)
- Early warning satellite modernization (evolution of Defense Support Program (DSP) to Space Based InfraRed System (SBIRS) satellites)
- Improved secure senior leader conferencing (day to day and stressed environments)
- Crypto modernization and cyber vulnerability assessment
- Hardening of critical communications links to Electromagnetic Pulse
- Airborne and ground mobile command post sustainment/modernization (National Airborne Operations Center, Mobile Consolidated Control Center)
- Support TACAMO ("Take Charge and Move Out") aircraft operations.

Led by Deputy Secretary Ash Carter, increased high-level attention has focused on needed steps to sustain and modernize essential NC3 systems and capabilities. The Senior NSPD-28 Oversight Committee (SNOC), co-chaired by the Under Secretary for AT&L and the DoD Chief Information Officer (CIO), has been revitalized. The SNOC's role is to oversee research, development and acquisition, and operational activities involving NC3 as well as facilitate high-quality communications links supporting Presidential conferencing and continuity of executive branch operations, whether day-to-day or in crises. We recently established an organization under the CIO—the Strategic and National Command, Control, Communications, and Intelligence (SNC3I) Joint Systems Engineering and Integration Office (JSEIO)—that serves as the principal systems architect for NC3 within the Department. The JSEIO will provide annual guidance to the Services and Defense Agencies regarding specific programmatic activities to be carried out in support of the overall NC3 system. Compliance with this guidance is mandatory; deviations must have the concurrence of the SNOC.

Work of the Nuclear Weapons Council

Over the past year, in this austere fiscal environment, the Departments of Defense and Energy have markedly strengthened their partnership in advancing a shared commitment to a safe, secure, and effective nuclear deterrent. Under the auspices of the NWC, the DoD CAPE office and NNSA collaborated on a joint review of DoD nuclear weapons requirements and of NNSA funding options to meet those requirements. NNSA provided unprecedented transparency into its entire program and the budgetary processes that support it. CAPE was able to apply its insights into the Department's acquisition programs to develop rough "should cost" estimates for, and identify potential for efficiencies in, NNSA programs. This comprehensive assessment resulted in a balanced approach involving some further adjustments to DoD modernization schedules, and adjustments to resource reallocations within NNSA's five-year program. In a separate effort, the two departments developed a 25-year "baseline plan" to synchronize schedules for warhead LEPs, modern delivery platforms to carry those warheads, and initial operations for supporting infrastructure. Further work is underway to confirm this baseline is affordable and executable over the long term.

The relationship between the two Departments is unique in government. In accordance with Presidential guidance, DoD generates the requirements for nuclear warheads. DOE, with a separate funding line and oversight from appropriations subcommittees separate from those that oversee DoD, conducts the research, development and acquisition programs that address those requirements. The legacy of this current arrangement evolved from the Manhattan Project in the 1940s when clear civilian control of this new and awesome technology, having both military and peaceful application, was mandated. That legacy has had certain benefits relevant even today, but it has also introduced inherent inefficiencies in the way nuclear weapons programs are now pursued. Section 3166 of the Fiscal Year 2013 National Defense Authorization Act establishes a Congressional advisory panel that will examine these and related issues in seeking to strengthen governance and oversight of the nuclear weapons enterprise. We, the DoD, look forward to working with NNSA and the panel to ensure that national security needs are most effectively and efficiently met.

Conclusion

The nuclear threat to the United States has evolved considerably since the end of the Cold War. No longer does the threat of a large-scale nuclear exchange hover constantly over the world. Yet, we cannot afford to be complacent. We must continue to field a strong nuclear deterrent that is supported by an agile and responsive infrastructure, and we must continue to carry out the threat reduction and nonproliferation activities that help to manage nuclear terrorist threats. The Department of Defense remains committed to its vital partnership with DOE in meeting the Nation's most fundamental security needs. In closing, I respectfully ask for your support for the President's FY 2014 budget request. This will ensure that we are fully capable of providing safety and security to the American people.