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S. HRG. 114–204, PT. 7

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2016 AND THE FUTURE YEARS DEFENSE PROGRAM

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

ON

S. 1376

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2016 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE MILITARY PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR, AND FOR OTHER PURPOSES

PART 7
STRATEGIC FORCES

MARCH 4, 25; APRIL 15, 22, 29, 2015

Printed for the use of the Committee on Armed Services

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CONTENTS

MARCH 4, 2015

	Page
U.S. NUCLEAR WEAPONS POLICY, PROGRAMS, AND STRATEGY	1
Kendall, Hon. Frank, III, Under Secretary of Defense for Acquisition, Technology, and Logistics; Hon. Brian P. McKeon, Principal Deputy Under Secretary of Defense for Policy; Michael S. Elliott, Deputy Director for Strategic Stability, Strategic Plans and Policy Directorate (J–5) Joint Chiefs of Staff; Adm Cecil D. Haney, USN, Commander, U.S. Strategic Command; and LT. Gen. Frank G. Klotz, USAF (Ret.), Under Secretary for Nuclear Security, Department of Energy, and Administrator, National Nuclear Security Administration	4
Questions for the Record	29

MARCH 25, 2015

BALLISTIC MISSILE DEFENSE PROGRAMS	31
McKeon, Brian P., Principal Deputy Under Secretary of Defense for Policy, Department of Defense	33
Syring, Vice Admiral James D., USN, Director, Missile Defense Agency Department of Defense	39
Mann, Lieutenant General David L., USA, Commanding General, U.S. Army Space and Missile Defense Command/Army Forces Strategic Command and Joint Functional Component Command for Integrated Missile Defense	49
Gilmore, Hon. J. Michael, Director of Operational Test and Evaluation, Department of Defense	58
Questions for the Record	79

APRIL 15, 2015

THE NATIONAL NUCLEAR SECURITY ADMINISTRATION PLANS AND PROGRAMS	83
Klotz, Hon. Frank G., Under Secretary for Nuclear Security, and Administrator, National Nuclear Security Administration, Department of Energy; Accompanied by Hon. Donald L. Cook, Deputy Administrator for Defense Programs, National Nuclear Security Administration, Department of Energy; Hon. Anne M. Harrington, Deputy Administrator for Defense Nuclear Nonproliferation, National Nuclear Security Administration, Department of Energy; and ADM John M. Richardson, USN, Director, Naval Nuclear Propulsion and Office of Naval Reactors, National Nuclear Security Administration, Department of Energy	85
Trimble, David C., Director, Natural Resources and Environment, Government Accountability Office	97
Questions for the Record	140

Page

APRIL 22, 2015

AIR FORCE AND NAVY NUCLEAR PROGRAMS AND THE IMPLEMENTATION OF NUCLEAR ENTERPRISE REVIEW RECOMMENDATIONS 145
Creedon, Hon. Madelyn, Deputy Administrator, National Nuclear Security Administration 146
Brumer, Dr. Yisroel E., Director, Strategic, Defensive and Space Programs, Office of the Secretary of Defense, Cost Assessment and Program Evaluation 150
Benedict, VADM Terry J., USN, Director, Strategic Systems Programs 153
Wilson, Lt. Gen. Stephen W., USAF, Commander, Air Force Global Strike Command 160
Harencak, Maj. Gen. Garrett, USAF, Assistant Chief of Staff, Strategic Deterrence and Nuclear Integration 169
Questions for the Record 189

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2016 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, MARCH 4, 2015

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

U.S. NUCLEAR WEAPONS POLICY, PROGRAMS, AND STRATEGY

The subcommittee met, pursuant to notice, at 3:33 p.m. in room SR–222, Russell Senate Office Building, Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Sessions, Fischer, Nelson, King, and Heinrich.

OPENING STATEMENT OF SENATOR JEFF SESSIONS, CHAIRMAN

Senator SESSIONS. The subcommittee welcomes Secretary Kendall and other distinguished officials. The witnesses represent the policy, acquisition, force structure and warfighter components of the U.S. nuclear weapons. Collectively they comprise the Nuclear Weapons Council (NWC), a body established by Congress in 1986 to facilitate cooperation and coordination between the Department of Defense (DOD) and the Department of Energy (DOE).

Today's hearing, however, will go beyond the specifics of the nuclear stockpile to address broader nuclear policy and strategy issues as the members see fit.

Let me just say, gentlemen, I believe the NWC is stronger and more effective than it has ever been. I believe there is better transparency. I believe there is better coordination between DOE and DOD. I think the fact that you have produced one statement that speaks for all of you is proof that you are getting along better than we have had sometimes in the past or a better coordination at least. It is something that I and I think Senator Nelson and others have pushed for in recent years, and it is really pleasing to me to see that we are moving in this direction.

So on balance, the President's 2016 budget and out-year spending profile represents a good faith effort, given the budget constraints, to modernize all three legs of the nuclear triad while

addressing aging DOD [Department of Defense] and DOE [Department of Energy] nuclear weapons and infrastructure problems.

Notably, for the first time since fiscal year 2012, the President's budget request for DOE and NNSA [National Nuclear Security Administration] nuclear weapons activities, which is $8.9 billion, meets the funding target established in the 2010 New START [Strategic Arms Reduction Treaty] treaty ratification process discussion and commitments that were made. So we are pleased about that.

Also, notable is Secretary Carter's announcement that there will be about $8 billion over the next 5 years to fund improvements across the nuclear enterprise to address current readiness, training, and infrastructure shortfalls. As Deputy Secretary Work explained in February, "our nuclear deterrent force is aging. It will be modernized in the 20s and 30s. We need to keep the old equipment and systems going, but it is becoming more expensive to do so."

Over the past few years, Congress moved forward with the President's nuclear modernization program indicating broad bipartisan support for nuclear modernization.

You know, to follow up on Bob Work's comments, General Klotz, you said last fall at the end of the Cold War, we entered into a sort of procurement holiday as far as our strategic nuclear forces were concerned, and we were able to do that because they were extraordinary capable systems. But now, after a couple of decades of doing that, the bill is coming due. I see some nods there. I think that is a fair statement of where we are.

I have got a chart we will show later that really does show the dramatic decline in the percentage of the defense budget going to nuclear weapons and the fact that we are going to now have to have some increase to maintain what I think is an essential requirement.

So, unfortunately, there remains a net $2.5 billion shortfall in DOE and NNSA weapons activity funding over the past 4 years that has led to some delays. Likewise, there has been a 2-year delay in fielding the new ballistic missile submarine, which will have operational consequences. Mr. Kendall, as you noted last year, quote, the program is fragile, and any funding reductions at this point could pose unacceptable risk to the health of the nuclear enterprise.

Critics of the nuclear weapons—and we have had some that have been pretty aggressive at times, but I think they have not prevailed in the battle of ideas. So their hopes to derail modernization plans by claiming that nuclear modernization is unaffordable or a distraction from more pressing nuclear capabilities has not prevailed. So we will address this claim today.

But I would note that according to CBO [Congressional Budget Office] estimates—and I think, colleagues, this is important—funding to maintain and modernize DOE and DOD nuclear programs will account for roughly 5 to 6 percent of the National defense budget funding 050 during the peak funding years. This is out there 2024–2025. There are a few years it peaks out there, but it is, I think, about less than 3 percent today.

If we examine only modernization cost, the cost of replacing existing delivery systems, missiles, planes, subs, and costs for life extension of the warheads, CBO estimates that during the period 2024 to 2030 modernization costs would average about $15 billion per year. According to OMB [Office of Management and Budget], national defense funding during that time would be over $806 billion in 2024, $15 billion out of $806 billion, which means that nuclear modernization will account for less than 2 percent of the defense spending during that period of peak funding. So the nuclear warheads themselves are a particularly small part of the budget. Considering the decades of decline in spending on nuclear forces, this level is not only affordable but certainly necessary.

So, Senator Nelson, glad to have you with us and any comments you would like to have. Welcome back to that seat. You have held it and chaired this committee over the years, and you have full experience in all of these issues.

STATEMENT OF SENATOR BILL NELSON

Senator NELSON. I am standing in for Senator Donnelly today who is away at a funeral.

But you remember those old times. The two of us got along on very controversial issues. Miracles never ceased. I used to persuade you to my position.

[Laughter.]

Senator SESSIONS. I always gave in to you whenever you were right, which was normal.

Senator NELSON. I want to get on. So what I am going to do is just insert my statement into the record. Thank you.

[The prepared statement of Senator Nelson follows:]

PREPARED STATEMENT BY BILL NELSON

Let me thank Senator Sessions for holding today's hearing. I will be filling in for a short period as ranking member since Senator Donnelly, the committee's ranking member, cannot make it today.

There are several issues I would like to consider today.

First the commitment we must make to our nuclear deterrent, which as Secretary Carter so aptly described as the "bedrock" of our national security strategy. This commitment is seen in two ways. What we must do now to ensure the force is ready and able to execute its mission if the President so chooses and second what we must spend in a time of tight budget choices, to modernize the force to meet our deterrence requirements for the next 20 to 30 years.

Second, I will want to understand how we are structuring our deterrent now and in the future to meet challenges not only with Russia, which is modernizing its triad but countries similar to China, which is developing a ballistic missile submarine that will patrol the South China seas or India and Pakistan which is increasing the size and scope of their arsenals, and in India's case, a ballistic submarine much like China.

Again, I want to thank Senator Sessions for holding this hearing and I look forward to today's testimony.

Senator SESSIONS. Thank you.

Secretary Kendall, do you want to give us the statement that you prepared?

STATEMENT OF HON. FRANK KENDALL III, UNDER SECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY, AND LOGISTICS; HON. BRIAN P. MCKEON, PRINCIPAL DEPUTY UNDER SECRETARY OF DEFENSE FOR POLICY; MICHAEL S. ELLIOTT, DEPUTY DIRECTOR FOR STRATEGIC STABILITY, STRATEGIC PLANS AND POLICY DIRECTORATE (J–5), JOINT CHIEFS OF STAFF; ADM CECIL D. HANEY, USN, COMMANDER, U.S. STRATEGIC COMMAND; AND LT. GEN. FRANK G. KLOTZ, USAF (RET.), UNDER SECRETARY FOR NUCLEAR SECURITY, DEPARTMENT OF ENERGY, AND ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Mr. KENDALL. Yes, Mr. Chairman. Thank you for your kind remarks at the beginning.

Chairman Sessions and I guess it is Acting Ranking Member Nelson, distinguished members of the subcommittee, on behalf of Admiral Haney, Lieutenant General Klotz, Honorable McKeon, and Mr. Elliott, thank you for the opportunity to appear before you today.

We are or we represent the statutory members of the Nuclear Weapons Council. The Nuclear Weapons Council (NWC) is a joint Department of Defense and Department of Energy National Nuclear Security Administration forum established to facilitate priorities between the two Departments as they fulfill their dual agency responsibilities for the U.S. nuclear weapons stockpile.

We look forward to discussing both the role of the NWC, the status of life extension programs, infrastructure, delivery platform modernization programs, sustainability of the stockpile and all other responsibilities charged to the council, as well as the challenge that we face.

Sir, I would like my written testimony which provides more detail—if I could ask it be admitted to record, please.

Senator SESSIONS. We will make it a part of the record, without objection.

Mr. KENDALL. Thank you, sir.

Our nuclear deterrent plays a unique and critical role in ensuring our National security. The Departments of Defense and Energy and the NWC have a fundamental and solemn obligation to responsibly manage this capability, to ensure its effectiveness and safety not only for today but into an uncertain and challenging future.

The fundamental role of our nuclear forces is to deter a nuclear attack on the United States and our allies, and no other military capability we possess is more important and deserving of our focus and attention more. For over 3 years, I have had the privilege to serve as chairman of the NWC, along with other professionals representing our nuclear enterprise such as those here with me today. During this period, the NWC has responded to policy direction, including the Nuclear Posture Review, the implications of the New START treaty, technical developments in the aging of the stockpile, the Defense Department reviews of the nuclear enterprise conducted last year, and other developments.

The strategy for our nuclear stockpile that forms the basis for our plans has remained constant during this period. That strategy known as the 3+2 strategy envisions three interoperable nuclear explosive packages for ballistic missiles, ground-based and sea-

based, and two air-delivered warheads. A nuclear warhead strategy is tied to the Defense Department's delivery system modernization plans, which include the *Ohio* replacement submarine, a replacement for our Minuteman III ICBMs [Intercontinental Ballistic Missile's], a new long-range strike bomber, and the replacement for the air-launched cruise missile. It is also tied to our plan to modernize the Department of Energy's infrastructure for plutonium, uranium, and tritium and the plan to sustain the science and engineering base that ensures our stockpile of nuclear weapons is safe, secure, reliable, and effective.

The 3+2 strategy addresses stockpile sustainment and modernization and meets policy objectives of sustained deterrence through a smaller stockpile with fewer weapons types and a modernized, responsive nuclear infrastructure capable of addressing the technological and geological surprises that we may face.

Making nuclear explosive packages interoperable on different delivery systems will reduce the number of different systems that must be maintained and provide sufficient diversity among our deployed systems.

Over my 3 years as NWC chairman, budget constraints, particularly the implementation of sequestration in fiscal year 2013, have forced the NWC to annually adjust its stockpile maintenance and infrastructure plans to fit within the resources appropriated. These adjustments cause delays or cancellations, reduce work scope, or extend development or production periods. Today we have reached a point where all flexibility from nuclear weapons life extension programs has been removed.

We have worked with the U.S. Strategic Command to adjust stockpile requirements where possible. We continuously strive to strike the best balance between the science and engineering required to certify the stockpile, the program's plan to extend the life of the stockpile, and the plans for a responsive infrastructure. Achieving our plans for tomorrow's stockpile will require adequate resources, national commitment, and balanced investments. The NWC remains committed to our responsibility to ensure a safe, secure, reliable, and effective nuclear strategic deterrent, and we urge continued congressional attention to the Nation's essential security needs by sustaining a stable nuclear enterprise budget in general and in specific removing the threat of sequestration.

Mr. Chairman, I thank you for your time, and we wait for your questions.

[The prepared statement of the Nuclear Weapons Council follows:]

WITNESS STATEMENT OF THE NUCLEAR WEAPONS COUNCIL:

HON. FRANK KENDALL, CHAIRMAN

ADM CECIL D. HANEY

HON. LT GEN (RET) FRANK KLOTZ

HON. BRIAN MCKEON

MR. MICHAEL ELLIOTT

Chairman Sessions, Ranking Member Donnelly, and distinguished members of the Subcommittee, thank you for the opportunity for the Nuclear Weapons Council (NWC) to testify before you today. The NWC is a joint Department of Defense (DOD) and Department of Energy (DOE)/National Nuclear Security Administration (NNSA) organization established to facilitate cooperation and coordination, reach consensus, and institute priorities between the two departments as they fulfill their dual-agency responsibilities for U.S. nuclear weapons stockpile management. Together, the Council represents extraordinary and highly skilled Soldiers, Sailors, Marines, Airmen, civilians, laboratory personnel, and contractors who are the core of the nuclear enterprise. They are professional, mission-oriented, and innovative problem-solvers charged with ensuring our Nation sustains a safe, secure, reliable, and effective nuclear deterrent. Today, we will discuss the role of the NWC, the status of life extension programs, infrastructure and delivery platform modernization programs, our ability to sustain the stockpile, and all of the other responsibilities of the NWC, along with our challenges.

NWC ORGANIZATION

As mandated by Title X, U.S. Code 179, the NWC manages and achieves consensus on priorities for the nuclear weapons stockpile. Our membership includes the Under Secretary of Defense for Acquisition, Technology and Logistics (Chairman), the DOE Under Secretary for Nuclear Security/Administrator of the National Nuclear Security Administration, the Under Secretary of Defense for Policy, the Vice Chairman of the Joint Chiefs of Staff, and the Commander of the U.S. Strategic Command. Additionally, to ensure all equities in the enterprise are represented, we receive consistent, valuable participation from the Military Services, the Comptroller, the DOD Office of Cost Assessment and Program Evaluation (CAPE), Department of State, and the National Security Council. Over the last year, the NWC convened 10 meetings, including our annual joint meeting with the United Kingdom Ministry of Defence, which we hold to review our continued cooperation in warhead development, the *Ohio*-class submarines, and the D–5 missile program.

In order to engage at all levels of the enterprise, we utilize our subordinate committees and action groups to identify and analyze issues and to provide recommendations to the Council. The NWC Standing and Safety Committee (NWCSSC), co-chaired by DOD and the NNSA, functions to advise, assist, and provide information and analysis and recommendations on issues and topics for the Council's consideration. Additionally, NNSA details a member of its staff to DOD to serve as the NWCSSC Executive Secretary, ensuring interagency representation in day-to-day operations. Finally, a dedicated working group of staff, representing the diverse stakeholders in the nuclear enterprise, meets informally about twice a month to review weapon and infrastructure programs. We continually analyze our current working relationships to ensure a streamlined decision-making process and to ensure that our teams are informed and empowered to assess issues and make recommendations to the NWC. NWC issues are not only addressed when the Members meet; our mission is executed every day through the organizational structure just described.

NWC MISSION

The NWC convenes approximately monthly to ensure focused attention on our greatest nuclear enterprise challenges in four vital areas. First, we must maintain and strengthen our ability to extend the life of warheads through comprehensive component reuse, refurbishment, replacement and ensuring alignment with the delivery platform (see Table 1 for a breakdown of the current and future nuclear weapons stockpile). Second, we must safeguard our ability to provide the intensive science and engineering required to assess an aging stockpile and certify the safety and effectiveness without underground testing. Third, we must remain steadfast in

our commitment to sustain and modernize our aging infrastructure that provides materials, components, and testing facilities essential for our nuclear deterrent enterprise. Finally, we must ensure that our nuclear weapons and delivery systems modernization programs are aligned.

Table 1. The Current and Future Triad Composition

	ICBM	SLBM	Air-Leg
		Current	
Weapon System	W87 Warhead W78 Warhead	W76 Warhead W88 Warhead	B61 Bomb B83 Bomb W80–1 Warhead
Delivery Platform	Minuteman III	Trident II D5	B–2A B–52H F15/F16 ALCM[1]
		Future	
Weapon System	W78/88–1 IW–1[2] IW–2 IW–3	W78/88–1 IW–1 IW–2 IW–3	B61–12 Bomb W80–4 Warhead
Delivery Platform	GBSD[3]	D5 Follow-on	B–2A B–52H JSF[4] LRSB[5] LRSO[6]

1 Air-Launched Cruise Missile
2 Interoperable Warhead
3 Ground-Based Strategic Deterrent
4 Joint Strike Fighter
5 Long Range Strike Bomber
6 Long Range Standoff

STOCKPILE PLANNING AND LIFE EXTENSION

The NWC sees our future nuclear stockpile as one that is flexible and adaptable to technical and geopolitical changes. As envisioned, the future stockpile plan will include three interoperable nuclear explosive packages for ballistic missiles and two air-delivered warheads, referred to as the "3+2 strategy." The 3+2 strategy addresses stockpile obsolescence and meets policy objectives of sustaining deterrence through a smaller stockpile with fewer weapon types and a modernized, responsive nuclear infrastructure capable of addressing technological and geopolitical surprise. Making nuclear explosive packages interoperable on different delivery platforms will reduce the number of different systems that must be maintained and serviced, while providing sufficient diversity among deployed systems.

The NWC oversees implementation planning for the strategy. Established in 2012 for the fiscal year (FY) 2014 budget formulation, the NWC's 25-year plan for the nuclear weapons stockpile—also known as the Baseline Plan—aligned warhead life extension plans, platforms modernization, and infrastructure needs. The coordinated Baseline Plan integrated NNSA nuclear security enterprise requirements and plans with operational warfighter requirements.

Budget realities have forced changes to the 2012 plan. Since the plan was adopted, we endorsed deferrals to several key warhead life extension programs (LEPs) and infrastructure modernization milestones, delaying implementation of our 3+2 strategy. We deferred the Interoperable Warhead 1 (IW–1) and delayed the Long Range Standoff (LRSO) warhead schedules. For the B83–1 bomb, we adjusted the deployed requirement to meet operational requirements and align with the air-delivered gravity weapon strategy. For the B61–12 bomb LEP, we accepted a schedule delay due to the sequestration cuts in the fiscal year 2014 budget. We have little, if any, margin left in the schedule for the program, and both Departments are aggressively managing costs and schedules. Plutonium pit production schedules and supporting plutonium infrastructure investments experienced significant delays due to shortfalls in the fiscal year 2013 and fiscal year 2015 budgets. Additionally, we accept risk each year in NNSA's science and engineering programs in order to achieve a balance between life extension work and the science and engineering needed for certification.

Continued uncertainty in our DOD and NNSA budgets, especially the threat of sequestration, exacerbates long-term challenges to our ability to sustain the stock-

pile. Despite these persistent challenges, we have had many success stories. The following highlights the work accomplished through the dedicated talent and focus of the people working in the nuclear enterprise.

B61 Bomb (Aircraft-delivered)

We are working to extend the lifespan of the B61 gravity bomb. In April 2010, the Nuclear Posture Review reaffirmed both the extended and strategic deterrent roles of the B61 bomb and directed its life extension. The B61–12 LEP with Air Force-provided Tailkit Assembly is undergoing development engineering and remains on schedule and budget to meet its March 2020 First Production Unit (FPU). The B61–12 LEP consolidates four variants of the B61 bomb—the -3, -4, -7, and -10—and improves the safety and security of the oldest nuclear weapon system in the U.S. arsenal. The B61–12 LEP will achieve: 1) a 50 percent reduction in the number of nuclear gravity bombs in the stockpile, 2) the removal of a megaton-class weapon—the B83–1, 3) an 80 percent reduction in the amount of special nuclear material in those bombs, and 4) the first step toward implementing the 3+2 strategy.

W88 Warhead (SLBM-delivered)

Over the last year, the nuclear enterprise faced several pivotal decisions for our future stockpile, one pertaining to the W88. The W88 SLBM warhead is in the development engineering phase for Alteration (ALT) 370 to replace the aging arming, fuzing, and firing components and is on schedule to achieve its December 2019 FPU. In August 2014, the NWC agreed to address potential conventional high explosive (CHE) scope for the W88, which was not part of the original ALT 370 program. After extensive review by our national laboratories, NNSA, and the Navy, the NWC made the decision to refresh the W88 CHE and identified the majority of funding offsets needed for this work. The offsets were generated by reducing sustainment activities and hedge quantities for some legacy systems to make the majority of funds available for the CHE refresh. The remaining required funds for CHE refresh in future years will be resourced from within the NNSA. That decision, identified areas where increased risk could be accepted to produce cost-savings within the current program—without additional funding—and without additional delays to future work.

Interoperable Warhead (for ballistic missile-delivered systems)

IW–1, also known as the W78/88–1, will be the first of three ballistic missile warheads under the 3+2 strategy. The IW–1 was delayed as part of the fiscal year 2015 budget request and is now scheduled for a 2030 FPU. In 2014, the NNSA completed an abbreviated IW–1 feasibility study and briefed the NWC with the conclusion that interoperable nuclear explosive packages could be used in the ICBM and SLBM forces. A full feasibility study is planned for completion in the early 2020s.

W80–4 (Long Range Standoff Cruise Missile Warhead)

Over the last two years, the NWC selected the follow-on warhead for the Air-Launched Cruise Missile replacement, the Long Range Standoff (LRSO) missile. We considered the B61, W80, and W84 warhead families. The interagency effort analyzed the trade space of military requirements, surety features, military characteristics, and cost. We performed rigorous analysis at all levels of the NWC structure to select the W80 Nuclear Explosive Package as the basis for the LRSO warhead, and designated the LEP as the W80–4. In January 2014, the NWC had delayed the LRSO warhead from an FPU of 2024 to fiscal year 2025–2027 but as a result of the ongoing program review, the fiscal year 2016 President's Budget requests resources for an fiscal year 2025 FPU and an fiscal year 2026 LRSO first missile delivery.

NNSA NUCLEAR ENTERPRISE INFRASTRUCTURE AND NUCLEAR MATERIAL COMMODITIES

The 2010 Nuclear Posture Review stressed the importance of a NNSA infrastructure that can respond to technical challenges or geopolitical surprises and ultimately enable our consideration of stockpile reductions. The NWC focuses specifically on the plutonium, uranium, and tritium capabilities to support the current and future stockpile as documented in the NWC's Baseline Plan. Our nuclear enterprise infrastructure challenges are two-fold: 1) addressing aged, end-of-life facilities maintenance, recapitalization, and replacement and 2) working to achieve a responsive infrastructure. In addition, NNSA's general purpose infrastructure (e.g., electrical distribution systems) that enables the plutonium, uranium, and tritium capabilities is also aging, brittle, and a limiting factor.

We reinforce NNSA's need to fully develop responsive and productive plutonium and uranium capabilities for this Nation. Today, these capabilities and their ena-

bling infrastructure are at great risk and rank among our highest priority infrastructure challenges. We must relocate our uranium production from 1950s-era buildings that are deteriorating rapidly and creating a hazardous work environment for our people. We must also have a plutonium pit production capability to support future stockpile requirements, move toward a responsive infrastructure, and address plutonium aging issues.

In January 2014, The Secretary of Defense revalidated the DOD requirement for NNSA to produce 50–80 plutonium pits per year by 2030. This analysis was predicated on four drivers for pit production: 1) policy objectives for the U.S. nuclear deterrent, 2) stockpile aging, 3) military requirements, and 4) infrastructure costs and capacity. The NWC is working with NNSA to achieve the requirement of 50–80 pits per year in 2030. NNSA developed a strategy to achieve this goal, including ramp-up time, through recapitalization of the existing Plutonium Facility 4 at Los Alamos and the construction of additional smaller, modular nuclear facilities for plutonium work. The concept of constructing smaller, modular nuclear facilities over time alleviates the cost associated with one large nuclear facility to replace all capabilities at one time. Building large, one-of-a-kind nuclear facilities presents significant challenges in terms of planning, design, and development and thus NNSA adopted a modular approach. The NWC engaged the DOD CAPE to assist NNSA on the benefits and feasibility of this strategy through a Business Case Analysis completed in November 2013. The CAPE agreed with NWC's endorsement that a modular strategy for nuclear facilities provides the most affordable and flexible option. The NWC supports NNSA's plan to achieve two operational modular plutonium facilities at Los Alamos by 2027. Success will require continued sustained funding over the next decade to design, construct, and ensure initial operational start-up.

Using lessons learned from the pit production approach, NNSA applied the smaller, scalable modular facility strategy to the Uranium Capabilities Replacement Project, the follow-on capability to produce nuclear weapon secondaries at the Y–12 National Security Complex. Congress has asked the DOD to validate its annual requirement for secondaries, and we are in the process of providing this analysis. We anticipate that our report will be consistent with our most recent NWC Baseline Plan and that there will be no changes to our requirements.

Finally, the ability to enrich uranium to produce tritium for stockpile use is a critical infrastructure issue, and the NWC remains focused on sustaining a supply of enriched uranium for tritium production. Under current policy guidelines, without a domestically enriched uranium production capability, we will eventually be unable to produce new tritium for stockpile use. The NWC remains cognizant of the stockpile's requirement for tritium and is supporting a DOE update of our tritium requirements. We will certify this requirement in a letter to Congress by April of this year. As we update the NWC Baseline Plan, we will include tritium along with plutonium and uranium infrastructure plans in the next revision.

STOCKPILE STEWARDSHIP

Science is paramount to the NWC's ability to sustain a safe, secure, reliable, and effective deterrent. NNSA's Stockpile Stewardship Program, composed of research, development, testing, and evaluation (RDT&E) facilities and personnel, enables the surveillance and assessment of the stockpile condition by revealing anomalies, evaluating impacts of anomalies on warhead performance, and implementing solutions. In general, RDT&E supports broader national security objectives by providing capabilities to avoid technological surprise and to have confidence in system performance. The NWC Baseline Plan relies on continued investments in research, development, design, and production capabilities—something that sequestration would threaten.

The link between science and engineering and the future stockpile is inextricable. This science base capability allows the Laboratory directors to conduct their annual assessment of the stockpile, certify components for longer life in the stockpile, and resolve warhead issues discovered during surveillance. Additionally, RDT&E plays an important role in enabling key elements of the stockpile vision, including interoperability, plutonium pit reuse, understanding plutonium aging effects, and technology certification for life-extended warheads. In fiscal year 2014, NNSA completed a comparative analysis of LEP options for the W78, W88, and interoperability and presented the results. This analysis demonstrated how the RDT&E capabilities of the Stockpile Stewardship Program inform stockpile design decisions and provide critical insight into the feasibility of the 3+2 strategy.

The nation needs a highly skilled nuclear workforce to meet future demands of our long-term stockpile plan. With the end of underground nuclear explosive testing, limited opportunities exist to exercise the full range of weapon design and produc-

tion skills, including materials handling, code development, and design and production engineering. Exacerbated by an aging workforce, the pressure and risk to sustain critical skills is increasing.

In the era of science-based stewardship—that is, implementing new components without underground testing—we must provide a strong science and research program that includes research, experiment, and advanced computation and modeling. The NWC endorses a balanced approach between the near and longer term risk we must take in to meet the needs of the nuclear deterrent within available budgets.

DOD NUCLEAR WEAPON PLATFORM MODERNIZATION AND ENTERPRISE REVIEW

As part of the 2010 Nuclear Posture Review, the National Security Council, DOD, and related agencies reviewed our deterrence requirements and the range of scenarios for which we must prepare. This analysis concluded that the Triad offers the flexibility needed for the range of contingencies we might face. We cannot say exactly what mix of capabilities the United States will require in the next 20, 30, or 40 years, but continued modernization of the Triad will provide future policy makers with a flexible and resilient range of capabilities.

Our budget request is consistent with our plans to ensure that current nuclear delivery systems can be sustained and that the modernization/replacement programs are affordable, executable, and on schedule to avoid capability gaps.

Most of the Nation's nuclear weapons delivery systems are reaching their end of life in the 2025–2030 timeframe and have been extended beyond their original service lives. While we can sustain these systems until they can be replaced in the 2025–2030 timeframe, we have little schedule margin between legacy systems' end-of-life and deployment of the replacement systems.

The recent Secretary of Defense-directed Nuclear Enterprise and Strategic Portfolio Reviews and the Program and Budget Review for the fiscal year 2016 budget formulation focused significant attention on recapitalization, sustainment, and modernization of our nuclear deterrence systems and infrastructure.

In the Intercontinental Ballistic Missile (ICBM) leg of the Triad, the Minuteman III will be replaced by a follow-on ICBM—the Ground Based Strategic Deterrent (GBSD). Within the SLBM leg, *Ohio*-class Ballistic Missile Submarines (SSBNs) will be replaced by new *Ohio*-class Replacement SSBNs. The Trident D–5 SLBMs are undergoing a life-extension, which is approximately 90 percent complete. Finally, for the bomber leg, the B–52H and B–2A bombers will remain critical elements of the Triad. The Long Range Strike-Bomber will become part of our long-range penetrating strategic bomber force in the late 2020s. The current air-launched cruise missile (ALCM) will be sustained through 2030 and will be replaced by the LRSO cruise missile.

We remain concerned about the ability to fund these modernization efforts within current resource levels. The replacement programs create a bow-wave in nuclear delivery system costs and modernization will require increased investment over current levels for much of the next 15 years.

The Defense Department is taking steps to control the costs of these efforts. However, even with success in this regard, we face difficult budget choices entering the 2020s in funding needed Navy shipbuilding programs, the *Ohio*-class Replacement, and the Air Force strategic deterrent recapitalization programs.

The NWC is working to ensure corresponding NNSA development programs remain aligned with the Nation's nuclear Triad revitalization. The NWC provides the Services, Joint Staff, Office of the Secretary of Defense, and NNSA a senior-level forum to address warhead and delivery platform system integration areas of concern, and develops budget and program recommendations to the Departments' leadership. The B61–12 LEP is an example of how the NWC coordinates planning and integration with the closely linked B61–12 Tailkit Assembly and Bomb Assembly programs. This integration allowed DOD to better tailor the acquisition plan for the Tailkit Assembly, ensured minimal disruption to ongoing development and testing activities, and supported a more effective stewardship of taxpayer investments.

The DOD Nuclear Enterprise Review highlighted evidence of systemic problems in the strategic deterrent forces that threaten the future safety, security, and effectiveness of our nuclear forces. These interrelated problems require cultural, structural, and sustained long-term solutions. We are addressing these issues and implementing solutions managed through monthly senior leadership meetings of the Nuclear Deterrent Enterprise Review Group chaired by Deputy Secretary of Defense Work. The review teams made clear the need to refocus attention and resources at all levels of the DOD on this essential mission with four targeted areas: 1) the morale and accountability of personnel, 2) a culture of excessive inspections, 3) the age and condition of the current infrastructure and maintenance, and 4) the organiza-

tion of the Nuclear Enterprise. The reinvigoration of the DOD nuclear enterprise remains the Defense Department's highest priority, and we are committed to treating it as such.

GOVERNANCE

The NWC's role expanded under the NDAA in 2013 to certify that the NNSA budget request meets NWC requirements. This certification process led to greater transparency between two Cabinet Departments, and it strengthened and unified our interagency relationship. We understand the congressional interest in the overall governance of the nuclear enterprise as expressed in the Congressional Advisory Panel Report on Governance of the Nuclear Security Enterprise. The NWC Members participated in interviews with the panel and received briefings on the final report's findings, conclusions, and recommendations. The NWC supports strengthening NNSA's planning and costing functions. The NWC is ready to assist NNSA with implementation, and we look forward to providing Congress with comments on this report in the weeks to come as requested in the fiscal year 2015 National Defense Authorization Act.

CONCLUSION

Budget constraints have forced the NWC to annually adjust its stockpile maintenance and infrastructure plans to fit within resources appropriated. These adjustments cause delays or cancellations, reduce work scope, or extend development or production periods. We have reached a point where we have removed all flexibility from the nuclear weapons life extension programs and have worked with the U.S. Strategic Command to accept lower stockpile requirements where possible. We continuously strive to strike the best balance between the science and engineering required to certify the stockpile, the programs planned to extend the life of the stockpile, and the plans for a responsive infrastructure. Achieving our plans for tomorrow's stockpile will require adequate resources, national commitment, and balanced investments. The NWC remains committed to our responsibility to ensure a safe, secure, reliable, and effective nuclear deterrent, and we urge continued congressional attention to the Nation's essential security needs by sustaining a stable nuclear enterprise budget in general, and by removing the threat of sequestration specifically.

Senator SESSIONS. Thank you.

I guess I will sum it up and ask all of you—and Secretary Kendall, you are going to answer, I guess, first. But do you believe that the basic plans that we have laid out that, as I understand, you support in your opening statement, a move to modernize our triad and our delivery systems and to modernize the aging warheads is a substantial need for America? It needs to be funded, and the general outline of funds can get this job done?

Mr. KENDALL. Yes, Mr. Chairman, absolutely. It is a critical national security need. The funding that we have requested for both Departments through the 5-year plan that we submitted is adequate to execute our plan during that period. After the end of that period, as we start to actually produce the systems I talked about, we are going to have an affordability program that we have to deal with. You alluded to that earlier.

Senator SESSIONS. Your period is what time?

Mr. KENDALL. This will surface in next year's budget. In 2021, we are going to start to have a problem finding ways to afford these systems. We will work to do that. It is a very high priority, and we will work to do that. But it is going to be a challenge for us.

Senator SESSIONS. Do any of you have any comment about that? Do you agree with the essential unity of statement of purpose and goal? Any other comments you would like to contribute?

Mr. KLOTZ. Senator, absolutely I agree with the statement. I would add that from the NNSA [National Nuclear Security Admin-

istration] Department of Energy side, we have taken a very careful look at the requirements in terms of what it means for our scientific, technical, and engineering base at the laboratories and production facilities, the workload that they will have as we move through the series of life extension programs and modernization of our plutonium, uranium, and tritium capabilities. This is a busy—it is a challenging but it is an imminently executable plan that we have laid out.

With one caveat, just to underscore what Mr. Kendall said, one of the most important things is stable and predictable funding so that we can ensure that we have the right people, the right tools, and the right facilities there to execute this program.

Senator SESSIONS. Well, Secretary Kendall, you said in March I believe of last year, quote, the program is fragile, and any funding reductions at this point could pose unacceptable risk to the health of the nuclear enterprise. You noted that budget constraints force the Nuclear Weapons Council to annually adjust its stockpile maintenance and infrastructure plans to fit within the money actually appropriated. And, quote, we have reached a point where we have removed all flexibility from the nuclear weapon life extension programs and have worked with the Strategic Command to lower stockpile requirements where possible.

So what do you mean by "fragile," and how serious do you consider stable funding to be?

Mr. KENDALL. It is very important.

What we have done is we have slipped the first production of the new submarine about 2 years, which puts it right up against—and we have to replace the existing submarine fleet. There are aging effects on the current force structure that are predictable and understood, and we have to deal with those. We acquired a lot of the current force structure basically at the same time historically. It is all aging out at the same time. The submarines are aging out.

Senator SESSIONS. Yes, submarines. I know one is celebrating its 30th anniversary in a few weeks, and others are pushing 40 I believe. That is a long time to maintain a sophisticated piece of equipment like that.

Mr. KENDALL. It is a long time. Both the hulls themselves and the reactors have predictable aging effects that have to be dealt with. The rocket motors and our ICBM's are similar. We have renewed those but we are going to be at a point where we have to modernize those again. There are a lot of older technologies in those systems that have to be replaced in the ICBM force. The air-launched cruise missile is showing a lot of reliability problems right now. It is becoming harder to maintain, and it is going to have to be replaced as well.

What we did in this most recent budget, which you may have noticed came in a little bit higher than last year's request in the out-years in the 5-year plan, was we were able to accelerate the Elkem replacement about 2 years because of those aging effects.

We are also seeing some effects in the nuclear stockpile itself. We found some money—and it is mentioned there, the item about the requirement for maintaining the stockpile. We found some money to address a conventional high-explosive problem in one of our warheads, which we had hoped would last longer than is going to be,

but we are seeing signs that it will not and we have to replace that. So that has added a few hundred million dollars of cost, which we were able to cover. But we are essentially out of room to maneuver in our plan.

Senator SESSIONS. Well, I think you are right. We have got a chart. Let me just show it.

[Deleted.]

Senator SESSIONS. This chart, I think, is pretty revealing, and it is produced by the Defense Department I believe. But it shows the blue you cannot read there is investments, and the red is operation and support for our nuclear enterprise, which includes the triad, I mean, our launch system, as well as the bombs. So you can see this dramatic reduction here in 2002 to 2010. We end up by 2017 to 2018, we got to start making some changes. This yellow is a new submarine, the *Ohio*-class. The new bomber. The orange is ICBM and the new SLBM [Submarine Launched Ballistic Missile], submarine-launched ballistic missile. Then it begins to drop again. It drops again in 2034 through 2042.

So I see that we have been able to go a long time, General Klotz, without putting much money in the system, and if we can get by and modernize our entire fleet for this small a percentage—maximal is the 15 percent, I believe. If we can get by at that, then we have not bankrupted the country and have still been able to maintain a robust nuclear deterrence that I think all of us share.

Senator Nelson?

Senator NELSON. Thank you, Mr. Chairman. I am going to yield most of my time to Senator King.

But let me just say this is a plan that you put out for $35 billion a year for 10 years, which is that blue added above the yellow there. Now, in the decade of the 2020s, you are expecting to product 50 to 80 pits a year. Is that sufficient?

Mr. KENDALL. We would like to have the capacity to produce 50 to 80. That number is, in part, a hedge against uncertainties of aging effects on the current stockpile. It puts us in a position—if there is a change in the geopolitical environment or a problem with our stockpile, we can respond to that. We do not know that we will have to actually produce that many pits.

General Klotz can probably address that question more fully.

Mr. KLOTZ. It does two things for us, Senator. The capacity to produce pits—which, by the way, it used to be very substantial during the Cold War period. We had a facility in Colorado, Rocky Flats, 30,000 square feet, produced thousands of pits, up to 2,000 pits a year. We now essentially have 60,000 square feet at Los Alamos in New Mexico to do the same thing, and our pit production is way down.

We will have a need, as we move towards the interoperable warhead, which will have an explosive package that could be used on both an Air Force and a Navy ballistic missile in the future that may require us to produce new pits, and I would be happy to discuss that in a little more detail in a closed session.

But also as Chairman Kendall said, this is also part of having a responsive infrastructure and a capability to respond to unforeseen political developments or unforeseen technical challenges within the stockpile. It is a capability that we need and that we

are in the process of pursuing through a plutonium strategy which has been approved by the Nuclear Weapons Council in a collaborative fashion. In fact, Chairman Kendall and I came up and briefed Members of the Hill, and it has been approved in the appropriations and authorization bills.

Senator NELSON. Well, I thought I was going to yield to Senator King, but the time has just about run.

Let me just say—Admiral Haney, the fiscal year 2016 budget begins a life extension of the air-launched cruise missile. Is there a military requirement for replacing our current air-launched cruise missile?

Admiral HANEY. Senator, absolutely. As mentioned by Chairman Kendall, the fact of the matter is the current air-launched cruise missile has reliability problems. It is well over its life, designed for about 10 years, and we are well over the 30-year point for the current missile system. It is important from a deterrence in warfighting requirement, given that we need to have for our air leg, our flexible deterrent part of the triad, the ability to have standoff capability now and well into the future.

Senator NELSON. Thank you.

Senator SESSIONS. Senator Fischer?

Senator FISCHER. Thank you, Mr. Chairman.

Gentlemen, I was pleased to see in the budget request this year that it moved up the development and the production of the replacement cruise missile to 2025. Secretary Kendall, previously the council had decided to delay that to 2027. Is there a consensus now among the members that 2025 is the date that you are anticipating and that you probably will stay with?

Mr. KENDALL. Thank you, Senator. Our preference was always to start that program earlier. Budget realities would not allow us to do it last year. We did, as I mentioned, come in with a slightly higher budget particularly in the out-years after 2016 in our 5-year plan. That allowed us to move it back up 2 years. There was very strong—and Admiral Haney may want to address this. There was very strong interest in accelerating that program if we could find a way to do it, and we did so.

Senator FISCHER. Thank you, Mr. Secretary.

Admiral, if you can clarify there, there is a difference between the nuclear cruise missiles and the nuclear gravity bombs and what they do in their missions. Can you enlarge upon that and why we need them?

Admiral HANEY. When we look at our air leg, the flexible leg of the deterrence, it is important as we look at today the B–2 capability, and part of that comes with the bomber—bomb piece. It does not have currently the capability to do an air-launched cruise missile. The B–52 platform requires the air-launched cruise missile to provide that standoff capability, unlike the B–2, designed with stealth. Very important. This platform, the B–52, will be around until around 2040. So we have more decades to come in its utilization, and as a result, we need to be able to have a reliable air-launched cruise missile, the long-range strike option we talk about today, in order to address, particularly as we look at how countries are developing more and more anti-access, access denial type of capability, to give us further reach and to make more complex their

decision matrix associated with escalating their way out of a conflict.

Senator FISCHER. It offers our commander in chief more options as you provide advice when conflicts may arise. Correct?

Admiral HANEY. That is correct.

Senator FISCHER. Thank you.

Mr. Elliott, if you could comment on this as well. These systems are not redundant. Are they? The two systems. They are specific in their missions?

Mr. ELLIOTT. They are, Senator. I would add on the bomb, for example, the B–61 that will replace the existing inventory of those is carried by our dual-capable aircraft also. They do not have a capability to carry the cruise missile. They do not have the capability to carry some of our larger weapons like the B–83. So it is critically important that we get that for both the dual-capable aircraft and for the strategic systems like the B–2, and it will be available for long-range strike bomber later on.

At the same time, aging systems like the B–52, which when the first Elkem came off the inventory or into the inventory, was already 20 years old, now past 50 years old, is no longer able to penetrate those defenses. Yet, it has significant capabilities and a replacement air-launched cruise missile, LRSO [Long Range Standoff Weapon] in this case, will extend its utility to the plan in its primary role of deterring attacks on the United States. So they are equally important and serve a very different purpose in our plans.

Senator FISCHER. Thank you.

General Klotz, thank you once again for allowing Senator King and I to come and giving us a very thorough tour of the facilities. We appreciated it and learned so much.

But if you could comment on moving the warhead up, and does it stabilize the load for the NNSA?

Mr. KLOTZ. Thank you very much for joining us out there in New Mexico. I am sure Senator Heinrich would say you visited two of the finest of the labs, but we love all our children in NNSA.

Senator FISCHER. We do, we do.

Mr. KLOTZ. If I could just make one point to what Mr. Elliott just said. On the gravity bombs, the B–61, they, in addition to the strategic bombers, also go into these dual-capable aircraft. Those are fighter aircraft that can conduct both conventional and nuclear missions. That capability is so essential to our overall policy of extended deterrence, in other words, providing that nuclear umbrella to our allies and partners across the globe. So that is why it is very important.

On the issue with moving the date to the left for the long-range standoff, we looked at that very carefully. This actually fits in very well with our workload projections. We will be in the phase of two other life extension programs where if we did not have work to do, we would have a gap in work for our employees at the laboratories, as well as the production plan. So by moving that a couple years to the left, it actually has a positive, beneficial effect by smoothing out the workflow, not having to go through letting some people go and then hiring them back at a later date.

Senator FISCHER. Thank you very much.

Thank you, Mr. Chairman.

Senator SESSIONS. Thank you.

Senator King?

Senator KING. I am not sure who to address this question to, but I note that a lot of our nuclear force calculations are based upon applying the terms of the New START treaty. My question is, is Russia abiding by the terms of the New START treaty, and do we know that?

Mr. MCKEON. Senator King, what we are seeing is that Russia is abiding by the New START treaty. The main, central limits of the treaty do not come into effect until February 2018, but the assessment of the intelligence community at the moment is that we expect that they will fulfill their obligations under the treaty.

We also have ongoing inspections and verification mechanisms in place with mutual inspections, and those are proceeding without any violations.

Senator KING. Thank you.

Mr. Kendall, when I hear the word "interoperable," it gives me a sort of uneasy feeling because I next think of the word "Joint Strike Fighter." Execution is as important as vision. "Interoperable" sounds good. Are there practical problems? Please reassure me that we are not going to make something more expensive and difficult by trying to make it interoperable.

Mr. KENDALL. We have completed a fair amount of study of options for a common word that could be used by either of the ballistic missiles. While we have delayed that 5 years now in our plan—it does not start until late in the 5-year plan—we do think that is technically feasible, and it will lead to significant cost savings as well. So "interoperable" in this case I think is a very, very different matter, the idea of three largely common variants of aircraft which is what we tried to do in the F–35.

Senator KING. Command and control, a crucial part of the nuclear deterrent. How do you feel about where we are in command and control particularly in light of the developing cyber threat?

Mr. KENDALL. It is a concern. I co-chair a body with the Vice Chairman of the Joint Chiefs, Admiral Winnefeld, which by statute now oversees the nuclear command and control enterprise.

We have taken some steps over the last 2 or 3 years to put some modernization funds into that part of the structure. Our chief information officer is currently doing a review of that and he is going to be reporting out very shortly to us. From the preliminary indications I have from him, we do have some additional things that we have to pay attention to. A lot of that infrastructure, like other parts of the nuclear enterprise, has been aging, and the cyber threats are getting much more severe over time. So we have to pay close attention to that.

Senator KING. We had a hearing a week or so ago with some deep thinkers on these issues, and one of the things they talked about was the Soviet—sorry—the Russian—that is the second time I have made that mistake.

Mr. KENDALL. I do that all the time too.

Senator KING. The Russian stockpile of tactical nuclear weapons. Is this a gap, if you will, in our deterrent? We are talking here about strategic weapons. If we are talking about deterrence, it is

important, it seems to me, to have something to deter the tactical usage.

Mr. KENDALL. That is a cause for concern. The Russians are changing their doctrine and they are pursuing an approach that we took at one time in the 1950s. We had a lot of small-yield, short-range nuclear weapons. The Russians seem to be going down a similar path and their doctrine is changing consistent with that. That would suggest a more willingness to use those to try to control escalation.

I would like to ask Secretary McKeon to address that because I know Policy has been looking at that very closely.

Mr. MCKEON. Senator, I probably cannot get into the numbers in this forum, but it is not a secret that Russia has more tactical nuclear weapons than we do. I think we still are of the view that our conventional and nuclear forces, taken together, provide us adequate capabilities to deal with that disparity in tactical nuclear weapons.

Admiral Haney may also have a view on that.

Senator KING. Ironically it appears that the world was turned upside down in terms of perceptions. We had them because we perceived the Red Army as a massive conventional threat, and I gather they now consider us to have a more severe conventional threat and therefore they are moving toward the tactical weapons that we were relying upon.

Mr. MCKEON. That is our assessment of why they have so many. It is because of what they perceive to be our overwhelming conventional spear.

Senator KING. A question about deterrence. The whole theory of deterrence rests upon rational state actors, and we are now in a world of irrational non-state actors. How do we develop a doctrine that is equivalent to deterrence? Deterrence was a very effective doctrine for 50, 60, 70 years. But how do we deter somebody who: (A) does not represent a country, and (B) does not care about dying?

Let the record show they pointed at each other.

[Laughter.]

Mr. KENDALL. It is a policy question, and I would like Secretary McKeon to address it. But that is a cause for deep concern, and that is why counter-proliferation is so important to us. We do not want one of these groups, who is exactly as you described them, get their hands on a weapon of mass destruction of any type.

Mr. MCKEON. I do not have much to add to it. Under Secretary Kendall said there are certain people who cannot be deterred. We keep a close eye on terrorist groups and others who are trying to get either nuclear weapons or nuclear material, and we have a lot of programs in this area that both our Department and the Department of Energy work on, and they are also a critically important part of our budget.

Admiral HANEY. The only piece I would add, Senator, is that as we look at the art of deterrence and the cost and benefit ratio, it is the whole-of-government kind of approach associated with that. As a result, as we look at that, although you might argue that rational thought and terrorism, for example—are they congruent or not? I would just say in terms of a reactor state or not, there are

costs and there are benefits, and we have to get at that in terms of the deterrence calculation.

Mr. KLOTZ. Can I pick up on a point that was raised earlier? That is, a very, very important part of our overall nuclear security strategy also deals with making sure that would-be proliferators and would-be terrorists can never get their hands on the special nuclear materials which they would need to either make a bomb or to fashion a nuclear or radiological device that they could use in a terrorist scenario.

So a large part of what we do and a large part of our budget requests, beyond the weapons activity, has to deal with putting in place systems to prevent proliferators or terrorists getting that material, if somehow they do, countering what they can do with that material, and then, God forbid, if anything ever actually happened, being able to respond to the consequences of that. So that is a very, very large part of what NNSA does, drawing upon the scientific, technical, engineering capabilities that are resident in our network of laboratories and production facilities.

Senator KING. Thank you, Mr. Chairman.

Senator SESSIONS. Thank you.

Senator Heinrich?

Senator HEINRICH. Thank you, Mr. Chair.

I want to thank you for bringing up the technical nuke issue. I think it is something we need to put a lot of thought into.

General Klotz and Under Secretary Kendall, I understand that you are already working to address some of the congressional advisory panel's recommendations for NNSA governance reform, and I wanted to ask on the specific issue of NNSA's structure, is that something you plan to address or do you think that this committee should be looking at legislation to improve on the current organization of NNSA within the Department?

Mr. KENDALL. I am going to let General Klotz deal with that question because it is a DOE organizational question.

But I will say that I think our relationship with NNSA has been very good. It has been very collegial. We have worked very closely together to try to address problems together. I think how the Department of Energy organizes itself and how the Congress chooses to have that organization in place—we will find a way to work together and get the job done in any arrangement. But I think the current arrangements are working fine from our point of view. I think my colleagues from the Defense Department would agree with that.

Mr. KLOTZ. Well, Senator, first of all, we appreciate the work that was done by the panel. They are a panel of distinguished Americans, many former Members of Congress represented on that, and they gave a lot of thought and spent a lot of time coming up with a very comprehensive list of recommendations.

Many of the recommendations that they make, particularly in the area of management, cost estimation, analysis of alternatives, project oversight, are things, quite frankly, which the Department under Secretary Moniz's leadership—he has been in the saddle between a year and a half–2 years. Now with confirmed leadership in key positions at NNSA, we are already moving out very smartly on in terms of enhancing the rigor and the discipline and the proc-

ess which we use for life extension programs, construction projects. Many of the things that the Secretary is doing and the Department is doing we can do within existing authorities which the Secretary or the Administrator of NNSA already have, and we are moving out on that.

In legislation that came out at the end of last year, I am required to submit a report by March 17, and we will lay out in some detail our views and our responses to each of the 19 overall recommendations and 63 sub-recommendations. I do not think, however, we will comment on how the Congress should organize itself as the panel suggested we do.

Senator HEINRICH. Everyone else does. You might as well.

[Laughter.]

Senator HEINRICH. General Klotz, I want to continue with another issue. I am a strong supporter of a modest set-aside of funding for laboratory-directed research and development, or LDRD. LDRD investment in high-risk, high-payoff activities supports the National security mission while allowing the lab scientists to pursue innovative solutions to some of our Nation's most challenging energy as well as national security problems. One of the things that this really helps with is attracting the best and the brightest talent. I actually believe that a set-aside for LDRD of 8 or even 10 percent can be justified.

I wanted to ask you more broadly. Do you agree that Congress should maintain a robust LDRD program?

Mr. KLOTZ. Absolutely, Senator. I could not have said it any better than you did. It has payoffs both in terms of the basic research that is necessary to maintain the stockpile but, more importantly, to recruit and retain the best and the brightest out of STEM programs at our leading colleges and universities by giving them the opportunity to work on leading-edge scientific and engineering work to establish their bona fides with their colleagues around the country. Once we allow them to do that, we find they get very intrigued by the other things that are going on in the laboratory, and we can hold——

Senator HEINRICH. We suck them in and they are there for 30-plus years, which is really the goal. Some of our most amazing scientists have been intrigued by these issues. It is one of those things that for not only retention, but just attracting them in the first place has been incredibly powerful.

One of the things that I would encourage my colleagues to do, as they get a chance to visit some of the labs, is to ask for a specific brief on some of the things coming out of LDRD because I have always been amazed. Not only is it really important for this sort recruitment and retention piece, but some of the most innovative things that spin off and end up helping our warfighters, really saving lives, doing things in the cyber field that we did not think was possible just a short time ago come out of these projects. It is fascinating to see that window. So I would encourage you all to do that.

I want to move on to Los Alamos really quickly. Your submitted testimony says that we reinforced NNSA's need to fully develop responsive and productive plutonium and uranium capabilities for this Nation. Today these capabilities and their enabling infrastruc-

ture are at great risk and rank among our highest priority infrastructure challenges. General Klotz, can you explain to the subcommittee how important it is to ensure that the replacement for the plutonium facility is built and that we get that rolling in order to address some of the issues that my colleagues brought up regarding pit production and unforeseen future events?

Mr. KLOTZ. Thank you, Senator. As I said earlier, we have gone down dramatically in terms of our ability as a Nation to produce pits either for future systems like the interoperable warhead or in response to a technical challenge that we have to deal with. Much of that work is going to be done at Los Alamos. There is also work done at our other labs and our other production facilities, but the heart and soul of that is at Los Alamos.

We have a plutonium strategy which this whole Nuclear Weapons Council has agreed to that will result in repurposing and reusing some of the space that is in the PF–4 and at the rad lab, and also later this year, we will establish a mission need statement regarding building additional modules which will allow us to move some of the work that requires the highest degree of security and safety and free up more space within PF–4 to actually do pit production.

Senator HEINRICH. So it is important again that we keep this on track. We have had great support from this committee and other committees on the Hill in terms of moving forward. I look forward to working with you on that.

Thank you, Mr. Chairman.

Senator SESSIONS. Senator Nelson?

Senator NELSON. First of all, I want you all to know how much we appreciate what you do. It is not in the press, and it is absolutely super important to the National security of this country. You all do it in a collaborative fashion, and the results speak for themselves. So thank you. Thank you.

Mr. Kendall, since you chair the council, it is my understanding that as an acquisition body that works with the NNSA to set requirements and develop planned warhead activities as you collaborate, do you think it needs to be expanded to include other groups such as the services or set requirements for DOD delivery platforms?

Mr. KENDALL. The short answer is, no, I do not. The council operates by consensus, and if you expand the group, it is harder to achieve consensus. I think we have the right people here before you, Admiral Winnefeld represented by Mr. Elliott, to represent the policy and the acquisition aspects from the Pentagon, as well as the operational aspects and the services through the Joint Staff and, of course, the Department of Energy through NNSA's Director.

I just want to make the comment that we do include in Nuclear Weapons Council meetings all the relevant stakeholders whenever we meet. So we have people there from our comptroller, financial side of the house, from our cost analysis and program evaluation, CAPE [Cost Assessment and Program Evaluation], organization, from each of the military departments, and frequently from the national security staff or perhaps OMB as well if they are engaged on the issue. So we are very inclusive. We include people. We hear

their points of view. We take them into account, and I think the membership is suitable as it is today.

I would invite my colleagues to comment on that if they would like to as well.

Mr. MCKEON. I agree with what Under Secretary Kendall said. Everyone is in the room who needs to be in the room. In my short time in the Department—I just got there in August—my impression is it all works pretty well at our level. There may be some skirmishes amongst our staff, but by the time it gets to us, we come together on recommendations. I do not get the sense that any of the services feel like they do not have an adequate voice in that forum.

Senator NELSON. Well, let me ask you something. You all have identified in your report, titled "The Report on Balance in Nuclear Weapons Programs," that you need to certify and maintain the current stockpile, that you need to perform the life extensions and you need to prepare to respond to future uncertainties. Can you explain each of those functions?

Mr. KENDALL. Sure. Our stockpile—because we cannot do any underground testing anymore, we have to keep track of the safety and security and reliability of the stockpile. So surveilling the stockpile, testing it, looking for any aging effects that might have been predicted is one activity that we have to do.

There are aging effects that take place that we understand, and those require us—and also, because there is some obsolescence of technology, we have to upgrades to the weapons over time. The B61, for example, is responding in part to some very obvious aging effects, which we understand and are aware of, and we are in a bit of a race against time to get that program and other programs like it done. So those two aspects deal with that.

We also have to consider any needs in the future in terms of production and have the infrastructure in place that will support those needs. Part of this, of course, is the life extensions programs. We need production for that. But if we were called upon to do more in the case of a geopolitical change or something we did not foresee, the infrastructure needs to be there to produce weapons as well as to meet the needs that we do foresee.

So those are the basic three pieces.

Frank, do you want to add to that?

Mr. KLOTZ. If I could add just a bit, Senator. Sometimes some people will make a distinction between production on the one hand and science, engineering, and research on the other. In my view, it is not an either/or situation. In order to do surveillance of the current stockpile and also understand those aging effects, we have to do some pretty leading-edge science and engineering, particularly as these systems age. As the components, the uranium, the plutonium, the tritium age, we need to understand that. The way we understand it is by doing diagnostic experiments and then putting the data from those experiments and past test data into high performance computing platforms which allow us to understand the effects of aging. They also allow us to understand the effects of changing components perhaps using new materials because the old materials are no longer manufactured or available.

Mr. KENDALL. If I could make a comment. I would encourage all of you to find an opportunity to come see nuclear weapons, come see what is in those designs. They are not simple devices. They are extremely complicated devices. If you look at some of the technology that is in some of our older weapons and you compare that to some of the newer life extension program designs, there is a remarkable difference. I think it will be very obvious to you why we need to do this work.

The other thing I want to say is that we have devices which are critical to national security which are terribly destructive that we cannot test, and we have maintained them. If you look at the chart that you have up there, this is largely the platform side, but there is a similar set of charts for the weapons side. We built a lot of weapons. We tried to keep them for about 40 years. We want to be sure that those weapons are safe, they will not go off accidentally. We want to be that if they ever are asked to go off, that they will go off reliably. These are very stringent requirements. This is a very stressing, difficult, technical task. It demands the best from our scientists and engineers. You should see for yourselves what we are doing with these systems. This is a very difficult task. What we are doing in the science and engineering program, other aspects of it are all necessary to ensure the safety, security, and reliability of that force structure.

Senator NELSON. Admiral Haney, in your opinion do we need new nuclear weapons, or can we do the job with the existing stockpile?

Admiral HANEY. We can do the job with the existing stockpile, Senator, as long as we work this 3+2 strategy, we work the life extension programs, as we have been talking about here. Those are critical for us to be able to sustain ourselves through the future. So I cannot say enough about staying on track with the 3+2 strategy.

Senator SESSIONS. Well, thank you, Senator Nelson.

Sort of to follow up on that and Senator Heinrich's questions, the 2015 STRATCOM report on balance in the nuclear weapons program suggests that due to the current funding emphasis on certifying the nuclear stockpile and performing life extension programs on aging weapons, there may be insufficient funding in science activity to respond to future uncertainties. In other words, there is concern about losing, "a full design and production capability," which is, "a critical component of the U.S. nuclear deterrent."

Maybe Admiral Haney and General Klotz, you can comment on that.

It also relates to the idea that we do not want to have legislation and funding so restricted that the good scientists who come up with good ideas are not even able to research and test them. Of course, Congress is not going to allow something new to be done that they have not ultimately approved. But do you feel like that is a problem? Would there be benefits derived from directing our scientists and engineers to gain practice and experience by designing at least, if not building, a new prototype weapon as we determine—as we go forward in the future?

Mr. KLOTZ. Thank you, Senator, for the question.

I am not a nuclear physicist. I am in awe of nuclear physicists. But when I visit the laboratories and when I visit the production plants, it seems to me that the work that our people are doing requires and imbues in them a very thorough understanding of the engineering and the operation of these very sophisticated, complicated devices. They are fully engaged and fully employed in that. Without going into the details of all that that means because of the level of sensitivity, I sense our people understand that.

We are, of course, concerned about the fact that a lot of our workforce is aging. Many of them came of age the same time I did, and they are about ready to pass the torch on to the next generation. So we have to provide them challenging work to do, but I think they have a full slate of challenging work to do.

The other important thing, as far as legislation is concerned on this or any other area—we have a broad consensus in the Nuclear Weapons Council that this is the right path that we are on. I think there is a broad consensus based upon authorization and appropriations on the Congress that we are on the right path. It seems to me that holding that consensus about the body of work that we have to do both on delivery systems and warheads that we have outlined in the 3+2 strategy is important to preserve.

Mr. KENDALL. Mr. Chairman, if I may. I am not a nuclear physicist either, but I am an engineer. I think the scientific and engineering challenge that we have placed upon our people does certainly give them the experience to be confident of their products.

I do not think we need to do new designs. We have very state-of-the-art modeling and simulation capabilities. We are doing laboratory testing and other testing, to the extent we can, to verify the performance of our systems and the components that we are upgrading or redesigning within the existing weapons design framework basically I think is adequate to keep the expertise at a reasonable level. I do not think we need to do new designs.

Senator SESSIONS. Admiral Haney?

Admiral HANEY. Chairman, I would also add the fact that when you look at the intricacies associated with these life extension programs that are underway or planned, those in themselves are challenging to the workforce and to such an extent that I think it also helps keep them proficient in terms of if there was ever a need for a new design, that we would have the workforce we need to do that, from the visits I have had. This business of reuse, refurbishment, and then the electronics associated with it is not trivial stuff, as Frank Kendall mentioned, and I just want to sound off that that in itself keeps them very gainfully not just employed but requiring significant thinking and cranial power.

Senator SESSIONS. Well, let us just say it this way. There is a consensus in the Congress, and when you say a consensus among yourselves, I think you mean you consider a little bit of the political world you live in when you make those statements that you have made.

The lab directors, as I understand, are concerned about having full design and production capability. They think that is a critical component to a nuclear deterrent because there could be future uncertainties and other developments by other countries.

So I am not rocking the boat. We are not going to rock the boat and say what some have said like if we are going to refurbish this thing, why do we not just build a new one. It will be safer, smaller, more capable, and more flexible, and probably cost less money.

So we are just going to update the ones we have got. That is the consensus that we have got.

But I think you do not want to hold your people back from if not doing design, doing work on possible new systems in the future. Would you agree with that? Maybe we could at least do that, Secretary Kendall?

Mr. KENDALL. I think we are constrained in what we can do, but I do think, as we said, that the work that we give our people is adequately challenging to maintain their expertise.

Mr. MCKEON. If I can add one thing, Senator.

Senator SESSIONS. Yes.

Mr. MCKEON. I was in a meeting in the first term with the Vice President, my old boss, and Secretary Chu and the three lab directors. General Klotz repeated this point the other day. They all said to a person that they have learned more in the last 20 years about nuclear weapons during the stockpile stewardship program than they did through several decades of testing. So you should ask them today if they still hold that view. General Klotz said that in our prep session the other day. So I think the work they have is definitely challenging.

Senator SESSIONS. Well, good. I think we can move forward the way we are. We will move forward in a bipartisan way. Let us do it that way.

General Klotz, look, I believe we need to complete the goals we have got and to refurbish these weapons on the timeframe we are. But it is an expensive proposition. We talk about how little we spend, but still, it is billions of dollars. We are talking about several years there at $15 billion a year. I guess what I would say to you and all of you is that if we have to have more buildings, more infrastructure, let us know, but do not ask for more than we need. We are not able to just rebuild whole new nuclear laboratories and research things. The initial idea was that there were going to be $8 billion and $10 billion and $12 billion buildings took us all a bit by surprise. So I think you are creatively working forward with modular approaches that get you the new space you need. So, again, if you have to have more, please let us know, but if you can keep that cost down, that is going to free up some money that we can do things we need to do with.

Mr. KLOTZ. Senator, I recall that when we met prior to my confirmation, that was one of the things that you stressed, and it has been uppermost in my mind ever since. I think you are right in terms of the modular approaches we take, but also in terms of repurposing some of the existing facilities we have and also looking for processes that will allow us to do things more effectively and with a greater margin of safety is also a thing that we are exploring. But we are focused on bringing discipline, rigor that is very much already a part of the DOD into the way in which we approach our project management, as well as program management.

Senator SESSIONS. Thank you.

Senator King?

Senator KING. Just a couple of follow-up questions.

One is I think your chart, Mr. Chairman, is very informative. It would be even interesting to compare it with the decline of the defense budget as a percent of GDP because what you have is a declining share of a declining share. The defense budget in 1962 was something like 5–6 percent of GDP [Gross Domestic Product]. It is now at 3.3. So it makes this even more dramatic in terms of its cost to the taxpayers.

Senator SESSIONS. Can I say one thing about that chart? The new bomber, as I understand it, is considered about three-fourths non-nuclear costs. So we have got the full cost of the new bomber in there, which is really a little higher. It makes it look a little higher than otherwise would be.

Senator KING. I do not think we have talked about this directly. All these plans and well laid scenarios and what you are going to do with refurbishing—what does sequester do to all that?

Mr. KENDALL. That is a great question, Senator.

Well, first of all, this is an extremely high priority for us. We would, I think, have to reexamine everything that both Departments do under sequester. That said, we are looking at the percentage of our budget that is involved here. We would do our best to protect this area because of the strategic deterrence mission area is so vital. I think we would have to make some adjustments, but I think we——

Senator KING. Do you have a choice to do so, or would sequester require cuts in this area as in all others? Would you have that kind of flexibility and discretion under the way the law is——

Mr. KENDALL. My understanding—and I may be incorrect about this—is that after fiscal year 2013, there is more discretion in how sequester is implemented, and we would have some discretion. I would hope that would be the case because doing what we did in fiscal year 2013 and taking the same cuts from everything essentially was a very dysfunctional way to take cuts.

Senator KING. But if you did protect this area, it would simply mean that we would have to take it out of readiness or end strength or modernization of the other part of the Defense Department.

Mr. KENDALL. That is right.

Senator KING. So is it fair to say that sequester would be damaging to this program?

Mr. KENDALL. Yes, it is.

Senator KING. Thank you.

Thank you, Mr. Chairman.

Senator SESSIONS. Senator Fischer?

Senator FISCHER. Thank you, Mr. Chairman.

General Klotz, you were discussing the issues that you faced with your workforce, whether they are aging and looking at retirement, to make sure that they are challenged with their work, to keep a workload even so you do not have to have layoffs and lose those people to other industries. I would ask Admiral Haney, do you have issues like that with your workforce at STRATCOM? Do you share some of those same concerns about keeping a workforce that has the abilities and the needed knowledge actively employed?

Admiral HANEY. Senator Fischer, absolutely I remain concerned. I would say we had the furlough. That was a signal to all of our workforce. Quite frankly, we lost some people as a result of that.

You combine that as well as how some of the pundits like to talk about this capability we have here in this discussion, the strategic nuclear capability, and as a result, in some of those discussions, it further devalues what this workforce is about that is so important to our country.

So this is an area that we spend time, just as I think General Klotz and his team does, in terms of working intern programs and what have you to connect this to universities to bring in new talent while at the same time working hard to retain the talent we have. Headquarters of your Strategic Command is about 60 percent civilian, very important when you look at the intricacies of the strategic deterrent that we keep the right and relevant workforce.

Senator FISCHER. We had a discussion earlier on the effectiveness of our nuclear deterrent and looking at the Russians and their tactical weapons. It kind of looked like maybe you wanted to join in that discussion. Did you have anything you wanted to say with regards to the effectiveness of our deterrent and also with the Russian tactical weapons and how those affect our outlook to the future as well?

Admiral HANEY. I thought our discussion was rich, and I agree with everything that was stated relative to our whole capability, strategic capability, as well as conventional capability that a joint military force operates day in and day out.

The only piece that I would add is when people talk about the use of a tactical nuke, I would just say if one of those were to go off and our deterrence failed, that tactical nuclear weapon or non-strategic nuclear weapon, as we sometimes call it, would have a strategic effect, and that we can ill afford to have.

Senator FISCHER. Thank you very much.

Senator SESSIONS. Senator Heinrich?

Senator HEINRICH. Let me follow up on that question just a little bit because with regard to the Russian tactical nuclear weapons, or non-strategic weapons, how do the rules of deterrence differ for tactical versus strategic nuclear weapons in your view? Are more tactical nukes, in other words, a better deterrent than maybe the conventional forces? How do those general rules—because I think everybody intuitively kind of understands how our doctrine and deterrence works with strategic nuclear weapons, but it seems to me that tactical nuclear weapons do not exactly operate by the same set of rules.

Admiral HANEY. Well, I would say it is not the weapons that operate by the rules. It is the actors, nation states, et cetera that have those weapons at their disposal that are more of a concern. I think it would be inappropriate for me to compare a brigade or a conventional capability and say X number of this equals one of that. I do not think that is what we are talking about. I think the real key, when you look at our strategic nuclear capability, it is to make deterrence work so that we do not have any type of nuclear weapon utilization, and a whole-of-government approach to that has to be part of that equation.

Senator HEINRICH. A related question sort of harkening back to Senator King's mention of non-state actors. Do you have any comments about how some of the more recent nuclear breakout states, the Pakistans, Indias, fit into our overall doctrine of deterrence?

Admiral HANEY. I would just say that—interesting you would ask that question. I had a deterrence symposium last year, and I had a Pakistani individual associated with their program and he had breakfast with me. I asked him about his program, and he wanted to make sure he was clear to me it was not a program against us. However, I would just say it is very problematic, as we watch Pakistan modernize its capability. As we have stated before here, part of this is being able to prevent more development of nuclear weapons in the world and to contain that piece. So looking at the modernization programs that Pakistan has right now can be troubling as we look into the future and how the world could change.

Senator HEINRICH. Thank you.

Sort of moving back to slightly more mundane issues, there has always been a little bit of a—and I will direct this back to, General Klotz—a perpetual question about balancing workload between Lawrence Livermore and Los Alamos. There have been a number of occasions where something was developed in Los Alamos and then shifted over to Livermore for work balance. I am curious. I would like your thoughts on what the future holds for these two labs, as you see it, in terms of work balance.

Mr. KLOTZ. Thank you, Senator.

First of all, I think we need both labs.

Senator HEINRICH. For the record, I would agree.

Mr. KLOTZ. Thank you, sir.

One of the key things that has been a part of our whole enterprise for the past several decades is the fact that the labs conduct peer review with each other. Without getting into any of the details, there have been instances in the past where, quite frankly, one lab was able to see things in a very different way and come up with a slightly different solution. On the issue of the W88, which we talked about, and the need for CHE refresh, one lab did the primary work, and another lab checked their homework. That as very useful to us I think in our deliberations in the Nuclear Weapons Council that we had that verification.

There is work the two labs do together that is very similar, and that is where we do a lot of the balancing of the work. But there are also some unique capabilities at each of the laboratories. Clearly, as I said earlier, Los Alamos is the center of excellence for plutonium science, chemistry, and operations. It also has facilities like DARHT, which are one of a kind. Lawrence Livermore in California has the National Ignition Facility, which is very, very important to us. Then, of course, Sandia in Albuquerque is the systems engineer for the entire enterprise. So I think we have got sort of the right mix there, and I think the balance is appropriate.

Senator HEINRICH. Thank you very much.

Senator SESSIONS. Thank you.

Just to pursue one a little more. In South Korea, the President said nuclear ambitions in the United States and Russia—no. That is a different report.

Here it is. He said as President I changed our nuclear posture to reduce the number and role of nuclear weapons in our National security strategy. I made it clear that the United States will not develop new nuclear warheads. So that is why we have just agreed to agree. We will not pursue new military missions for nuclear weapons. We have narrowed the range of contingencies under which we would ever use or threaten to use nuclear weapons. He said that at Hankuk University in South Korea, and it caused a lot of unease among our Korean allies, among others.

Under Secretary of State Rose Gottemoeller in Prague in December of last year said we have seen new and enduring pressures on the nonproliferation regime, pressures that threaten global stability. We are seeing nations turn away from cooperation, turn away from the common good of nonproliferation efforts, and cling ever more tightly to their nuclear arsenals. I think that is true.

This is the U.S. National Intelligence Council, Global Trends 2030 that was produced in December 2012. "Nuclear ambitions in the United States and Russia over the past 20 years have evolved in opposite directions. Reducing the role of nuclear weapons in U.S. security is a U.S. objective, while Russia is pursuing new concepts and capabilities for expanding the role of nuclear weapons in its national security."

It goes on to say, "other nuclear powers, such as Pakistan and potential aspirants, Iran and North Korea, desire nuclear weapons as compensation for other security weaknesses." So I think that is accurate.

I asked former Secretary Kissinger at a hearing a few weeks ago about the negotiations with Iran, and he actually was alarmed. He thought our negotiation position had moved too far, that we are accepting too close an ability of Iran to have a nuclear weapon, noting that if we were down to 9 months, he explicitly said Turkey, Saudi Arabia, and Egypt he believed would develop or buy a nuclear weapon.

So I do not know how we achieve nuclear stability around the world. We have had it pretty good for a long time. But if we have three or four Nations or five nations in the Middle East all with nuclear weapons, this is taking us in the wrong direction. It really is dangerous, and there would be a major expansion of the number of countries that would have nuclear weapons.

So forgive me if I am a bit concerned that de-emphasizing our nuclear posture could have the perverse effect of lessening confidence or increasing the desire of other nations to expand theirs—well, I do not know that I will say any more about that.

If any of you would like to comment on it, I would be—Secretary McKeon, you are the policy man. Maybe you would like to comment on it. But things are not going as well as we would like with regard to the risk of nuclear proliferation.

Mr. MCKEON. Senator, you have laid out a pretty complicated set of statements there. Let me try to address some of them.

On the first one, in terms of the Koreans—Mr. Elliott may be able to add some flavor to this—we spend a lot of time worrying about extended deterrence and our commitments both in Europe and in Asia. In fact, Mr. Elliott just returned from some extended deterrence talks both with our Japanese and Korean partners that

he does in concert with somebody on my staff, Elaine Bunn, who is the Deputy Assistant Secretary. So he can speak to the current Korean frame of mind.

I would agree with Under Secretary Gottemoeller that the nonproliferation system is under stress. We have an NPT review conference coming up next month where the system will be debated. In terms of the Middle East, there is no question. It is one of the reasons that the President is trying to prevent Iran from getting a nuclear weapon is the concerns among proliferation among its neighbors if they were to have a breakout capability, which is what these talks are about.

Senator SESSIONS. Well, thank you.

Do any of the others have any comments?

[No response.]

Then we will wrap it up. Thank you all. It was a very excellent panel. I appreciate the good work of what you are doing, and I think it has made a positive impact financially and to our national security.

[Whereupon, at 4:50 p.m., the subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR MARTIN HEINRICH

SUPPLY CHAIN MANAGEMENT CENTER

1. Senator HEINRICH. General Klotz, many small businesses in New Mexico are concerned about the NNSA's increasing the targets for M&O contractors to use enterprise-side purchasing agreement through the Supply Chain Management Center (SCMC). Small and disadvantaged businesses believe NNSA's and EM's use of enterprise-wide agreements tilts the playing field against them, resulting in lost business, lost jobs, reduced community involvement, and harm to the local communities' economies. Northern New Mexico is especially impacted given Los Alamos National Laboratory's massive size relative to the local economy. As use of the SCMC grows, M&O contractors will find it increasingly difficult to meet their contracting goals for small and disadvantaged businesses.

What are NNSA and EM doing to ensure small disadvantaged businesses are notified of opportunities from SCMC and can successfully compete for enterprise-wide purchase agreements?

General KLOTZ. Discounting Supply Chain Management Center (SCMC) agreements for travel and procurement/bank cards, where there are no opportunities for small businesses, 95 percent of SCMC agreement dollars are with small businesses. The SCMC works with the 24 NNSA and EM contractor locations that use its ePlatform tools and enterprise-wide agreements to identify opportunities to educate potential small business suppliers; individual companies contact SCMC directly to request assistance; and, SCMC attends DOE's Small Business Expos to provide demonstrations and information about SCMC, including its platforms and processes. Additionally, SCMC has an initiative and process to work with the DOE/NNSA contractors to identify potential local agreements that can be expanded to all SCMC user contractors in order to improve the financial impact to the local community. Enhancing that initiative, the SCMC has planned to launch a web site this month or in the very near future to provide a "small business information exchange." Also, SCMC, in collaboration with Los Alamos National Laboratory (LANL), recently completed an initiative to address Northern New Mexico small business concerns by incorporating the LANL "subcontractor's Regional and Community Development Plan," clause to its solicitations and agreements. Through SCMC agreements, small businesses are able to reach the many DOE/NNSA contractors at once, where previously they would have needed to compete for individual contracting opportunities.

LOCAL SPENDING

2. Senator HEINRICH. General Klotz, the NNSA's national laboratories and facilities play a vital role in my state's economy. However, in fiscal year 2014, Sandia National Laboratories' spending in New Mexico declined $58 million over fiscal year

2013 and LANL's New Mexico spending declined $63 million. Are there ways to strengthen the M&O contractors' annual performance management plans to ensure local businesses have an equal opportunity to compete for procurements?

General KLOTZ. All NNSA management and operating contractors have commitments to local community development which are often manifested through subcontract awards to local businesses. Sandia National Laboratories and Los Alamos National Laboratory routinely spend well over half of their procurement dollars in New Mexico. Strategic Sourcing agreements issued by the NNSA M&O Supply Chain Management Center to Northern New Mexico small businesses are being used by additional NNSA contractors and four DOE contractors as well. These actions resulted in contractors spending $29 million in fiscal year 2014, and thereby expanding the business base on a national scale. Additionally, the Supply Chain Management Center and Los Alamos National Laboratory have collaborated to incorporate LANL's requirement ' Subcontractor's Regional and Community Development Plan" into SCMC solicitations; thus levelling the playing field for all suppliers and ensuring further commitment to community development within Northern New Mexico. Lastly, Los Alamos National Laboratory provides for a 5 percent pricing preference for Northern New Mexico businesses.

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2016 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, MARCH 25, 2015

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

BALLISTIC MISSILE DEFENSE PROGRAMS

The subcommittee met, pursuant to notice, at 3:32 p.m. in room SR–222, Russell Senate Office Building, Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Sessions, Fischer, Sullivan, Donnelly, and King.

OPENING STATEMENT OF SENATOR JEFF SESSIONS, CHAIRMAN

Chairman SESSIONS. We just left an Armed Services Committee briefing with President Ghani and Dr. Abdullah, so some of our members are still there participating in that, but I wanted to go on and get started on this important hearing.

Thank you for being with us. Thank you for the work you have been doing, which I think is smart and sound and on the right path, in general.

Ten years ago, the United States began initial operations of the Ground-Based Midcourse Defense system, our homeland missile capability. Today we enjoy a good measure of protection against limited ICBM threats, especially from rogue nations like North Korea or, potentially, Iran.

In 2 years, we will increase that capacity from 30 to 44 interceptors. I think that was a good step. In 5 years, we will enhance the GMD sensor network and begin to retrofit the ground-based interceptors with a high-performance, Redesigned Kill Vehicle. Also, I believe it will be successful, and I believe that will be a major step forward.

Within 10 years, the plan is, in the words of Admiral Syring, to "revolutionize our missile defense architecture" by placing several kill vehicles atop each GBI, increasing the number of lethal objects that can be intercepted with a single GBI.

So the important question is whether Admiral Syring has sufficient funding, because the threat continues to grow. As it has

evolved from the Strategic Defense Initiative Organization to the Ballistic Missile Defense Organization to today's Missile Defense Agency, the men and women who design, develop, and deploy our homeland and regional missile defenses deserve the thanks of the Nation.

I know that we are working hard to make sure that THAAD is alert and with good morale and excellent leadership.

Admiral Syring, in particular, deserves credit for his recommendation to modernize the entire GMD system, including the interceptors, the sensors, and ground components, especially with the financial constraints we are under. In fact, this year's 5-year spending plan for MDA is about $6 billion below the spending projection provided several years ago.

A recent memo to the Secretary of Defense from the chief of Naval Operations and chief of staff warns that "ballistic missile threats are increasingly capable, continue to outpace our active defense systems, and exceed our Services' capacity to meet combatant commanders' demand."

Two Service Chiefs call for long-term BMD strategy that addresses homeland and regional missile defense from a more holistic approach, including nonkinetic means.

Perhaps General Mann can explain what prompted this appeal, and Mr. McKeon can shed light on the Secretary's views on it. The memo does raise an important point, which is, what is the future of ballistic missile defense?

The MDA has been so focused on deploying our current missile defense capabilities that it has had little time or funding available to think about the next generation of missile defense capabilities that will be necessary to address the growing threat, although I know all of you have given thought to that.

As Deputy Secretary Work recently noted, we need to come up with other ideas to defeat this threat. I think that is a good challenge to all of us.

While MDA does have an advanced technology component, it is too limited, in my view, and what it can hope to accomplish over the next 10 years is important. Perhaps what is needed is a new Strategic Defense Initiative.

So I turn to our ranking member for his opening remarks, and look forward to hearing from our excellent witnesses.

Without objection, all statements will be entered into the record.

STATEMENT OF SENATOR JOE DONNELLY

Senator DONNELLY. Thank you, Mr. Chairman. I want to thank Senator Sessions for holding this hearing.

Let me also thank our witnesses for testifying. We very much appreciate the time you took to prepare for today's hearing and for the work you do for our country.

Protecting our country and our forward-deployed troops around the world is of utmost importance. I am pleased we have begun to get our missile defense systems on track so they perform reliably and effectively. We should continue to improve our sensor and discrimination capabilities, so we have a better picture of the threats.

We need to continue to conduct smart simulation and testing before we commit to buying new technologies. Fly before you buy has been a tough lesson learned in these programs.

While we continue to improve our homeland defense systems, we should not take our eyes off the ball when it comes to protecting our deployed troops and reassuring our allies and partners. The demand from our combatant commanders for Aegis ships, for THAAD, and for Patriot batteries remains high. We need to consider how we can best allocate these systems and effectively train the warfighters who will operate them to provide the protection that is needed in today's budget-constrained environment.

Finally, I would be remiss if I didn't note the great relationship between MDA and my constituents at Purdue in West Lafayette. You have formed a great partnership that I think adds tremendous value to our Nation, and I know that the Boilermakers are glad to support MDA's mission.

Thank you again for coming today, and I look forward to the dialogue.

Chairman SESSIONS. Thank you, Senator Donnelly.

We will have 6-minute rounds, and maybe we can start right off.

Senator King, do you have an opening statement?

Senator KING. No, Mr. Chairman.

Chairman SESSIONS. Oh, from the witnesses. Well, we would like to hear your opening statements.

Mr. Secretary, would you like to start first?

STATEMENT HON. BRIAN P. MCKEON, PRINCIPAL DEPUTY UNDER SECRETARY OF DEFENSE FOR POLICY, DEPARTMENT OF DEFENSE

Mr. MCKEON. I would be happy to, Mr. Chairman.

Chairman SESSIONS. Pardon me for getting ahead of myself.

Mr. MCKEON. No worries.

Mr. Chairman, Senator Donnelly, Senator King, thank you for the opportunity to be here today to testify on the fiscal year 2016 budget request for missile defense, which we regard as a critical national security priority. We are grateful for your attention to and support of this critical mission of defending our Homeland, our partners and allies, and deployed forces.

The President's budget requests $9.6 billion in fiscal year 2016, of which $8.1 billion is for the Missile Defense Agency to develop and deploy missile defense capabilities that protect the U.S. Homeland and strengthen regional missile defenses.

Sequestration levels would, of course, be significantly lower and, as Secretary Carter has said, would make the Nation less secure. Even without sequestration, however, in these austere times, there is not enough money to fund every program that we might wish to have. We are required to prioritize investments accordingly.

As members of this subcommittee, you are well aware of the ballistic missile threats and trends. I will focus on several key policy priorities for addressing these threats: defending the United States against limited long-range ballistic missile attacks, strengthening defense against regional missile threats, fostering defense cooperation with partners, and examining how to advance the missile defense technology base in a cost-effective manner.

The U.S. homeland is currently protected against potential ICBM attacks from states like North Korea and Iran. To ensure that we stay ahead of the threat, we are continuing to strengthen our homeland defense posture and invest in technologies to better enable us to address emerging threats in the next decade. This requires continued improvement to the Ground-Based Midcourse Defense system, including enhanced performance of the ground-based interceptor and deployment of new sensors.

As you noted, Mr. Chairman, we are planning to deploy 14 additional interceptors in Alaska. We are on track to do that by the end of 2017. These interceptors, along with the 30 currently deployed, will provide protection against both North Korean and Iranian ICBM threats as they emerge and evolve.

We have also deployed a second forward base missile defense radar in Japan that is operating today thanks to the hard work of MDA and the Japanese Government. This radar strengthens both our homeland and regional defenses.

This year's budget request also reflects the department's commitment to modernizing the GMD system. It will move us toward a more reliable and effective defense of the United States. It includes funding for development of a new radar that, when deployed in Alaska, will provide persistent sensor coverage and improve our discrimination capabilities against North Korea. It also continues funding for the redesign of the kill vehicle for the ground-based interceptor.

As directed by the Congress, the MDA is also conducting environmental impact studies at four sites in the Eastern part of the United States that could host an additional GBI missile field. These will be completed next year.

The cost of building an additional missile defense site in the United States is very high. Given that the ICBM threat from Iran has not yet emerged and the need to fix the current GBI kill vehicles, the highest priorities for the protection of the homeland are improving the reliability and effectiveness of the GBI and improving the GMD sensor architecture.

The current GMD system provides coverage of the entire United States from North Korean and potential Iranian ICBMs, and no decision has been made to deploy an additional missile field in the United States.

Our request also continues to implement deployment of missile defenses tailored to security circumstances in Europe, the Middle East, and the Asia-Pacific. Our focus is on developing and fielding missile defense capabilities that are mobile and relocatable, which allow us to address crises as they emerge.

We also encourage our allies and partners to acquire missile defense capabilities and to strengthen operational missile defense cooperation.

This year, we initiated a Joint staff-led effort to update the 2012 Joint Capabilities Mix study to ensure we are making the most effective regional missile defense investments possible. In a regional context, we know we will not be able to purchase enough interceptors to rely purely on missile defense for the duration of a conflict.

In such a situation, we must protect our most valuable assets, while also drawing on our other capabilities to provide a comprehensive approach to defeating the threat from ballistic missiles.

We must continue to look ahead. This means ensuring that our investment strategy and priorities balance the needs of addressing the most dangerous threats we confront today while positioning us to respond to threat developments in the next decade. Our budget contains various technology investments in that regard.

In conclusion, the austere budget environment will continue to compel us to make difficult choices. Sequestration would undermine our ability to improve the GBI fleet, place new and advanced sensors, and defend our deployed forces and allies against ballistic missile attack.

Quite simply, it would hinder our ability to keep up with the growing threat. We believe we cannot let our guard down, much less in the current security environment, so we urge you to focus on repealing sequestration, and we would ask you to fund our request for missile defense.

Thank you very much.

[The prepared statement of Mr. McKeon follows:]

PREPARED STATEMENT OF MCKEON

Chairman Sessions, Ranking Member Donnelly, members of the Subcommittee, thank you for the opportunity to testify on the Fiscal Year 2016 Budget Request for missile defense, a critical national security priority. I am grateful for your consistent attention to and continuing support of the critical mission of defending our homeland, our partners and Allies, and deployed forces from a growing ballistic missile threat.

Let me offer my assessment of how the programs and fiscal year 2016 budget request for the Missile Defense Agency (MDA) ensure we are sustaining and modernizing our homeland missile defense capability so that we remain ahead of the threat while providing effective, integrated, and interoperable regional ballistic missile defense (BMD) capability. The President's budget requests $9.6 billion in fiscal year 2016, of which $8.1 billion is for the MDA to develop and deploy missile defense capabilities that protect the U.S. homeland and strengthen regional missile defenses. Sequestration levels would, of course, be significantly lower and as Secretary Carter has said, would make the nation less secure. Even without sequestration, however, in these austere times, there is still not enough money to fund every program we might wish to have, and we are required to prioritize investments accordingly.

I will begin with a discussion of ballistic missile threats and other trends, and then focus on several key policy priorities: defending the United States against limited long-range ballistic missile attacks, strengthening defense against regional missile threats, fostering defense cooperation with partners, and examining how to advance the missile defense technology base in a cost-effective manner.

BALLISTIC MISSILE THREATS

Ballistic missiles continue to become more survivable, reliable, and accurate at greater ranges, and regional powers are basing more missiles on mobile platforms. Technical and operational measures to defeat missile defenses are also increasing. Several countries are designing missiles to launch from multiple transporters against a broad array of targets, enhancing their mobility and capacity for salvo fires, which increases their effectiveness on the battlefield. Shorter launch time preparations are making newer systems more survivable.

Iran

Iran already has the largest inventory of ballistic missiles in the Middle East, and today can strike targets throughout the region and into Eastern Europe. In addition to its growing missile inventories, Iran is seeking to enhance lethality and effectiveness of existing systems with improvements in accuracy and warhead designs. Iran is developing an anti-ship ballistic missile which could threaten maritime activity

throughout the Persian Gulf and Straits of Hormuz. While Iran has not yet deployed an intercontinental ballistic missile (ICBM), its progress on space launch vehicles—along with its desire to deter the United States and its allies—provides Tehran with the means and motivation to develop longer-range missiles, including an ICBM. Iran publicly stated that it intends to launch a space-launch vehicle as early as this year capable of intercontinental ranges, if configured as such.

North Korea

North Korea's weapons and missile programs pose a serious threat to the United States and to East Asia. North Korea has conducted three nuclear tests. It is also seeking to develop longer-range ballistic missiles capable of delivering nuclear weapons to the United States, and continues efforts to bring its KN08 road mobile ICBM to operational capacity. While the reliability of an untested North Korean ICBM is likely to be very low, North Korea has used its Taepo-Dong-2 launch vehicle to put a satellite in orbit, thus successfully demonstrating technologies applicable to a long-range missile.

North Korea's efforts to produce and market ballistic missiles raise broader regional and global security concerns, by threatening the United States' allies and partners and increasing our concerns about ballistic missile technology proliferation.

Syria

While Syria does not pose a ballistic missile threat to the U.S. homeland, the Assad regime does possess short-range ballistic missiles, and has shown a willingness to use them repeatedly against its own people. Syria has several hundred short-range ballistic missiles, all of which are mobile and can reach much of Israel and large portions of Iraq, Jordan, and Turkey from launch sites well within the country.

Other Trends

In the regional ballistic missile context, one trend that particularly concerns the United States is China's development of advanced ballistic missiles. China is augmenting the over 1,200 conventional short-range ballistic missiles with a limited but growing number of conventionally armed, medium- and intermediate range ballistic missiles that will improve China's ability to strike regional targets at greater ranges. China also continues to deploy growing numbers of anti-ship ballistic missiles.

Russia's recent behavior currently poses one of our most pressing and evolving strategic challenges—challenges felt across the strategic forces mission space. We are confronted with Russia's occupation of Crimea, continuing Russian aggression in eastern Ukraine, Russia's increasingly aggressive nuclear posturing and threats, including the prospect of nuclear weapons in Crimea, and its violation of the Intermediate-Range Nuclear Forces (INF) Treaty.

Homeland Defense

The U.S. homeland is currently protected against potential ICBM attacks from states like North Korea and Iran. To ensure that we stay ahead of the threat, we are continuing to strengthen our homeland defense posture and invest in technologies to better enable us to address emerging threats in the next decade. This requires continued improvement to the ground-based midcourse defense (GMD) system, including enhanced performance of the Ground-Based Interceptor (GBI) and the deployment of new sensors.

We remain on track to deploy 14 additional interceptors in Alaska by the end of 2017. These interceptors, along with the 30 that are currently deployed, will provide protection against both North Korean and Iranian ICBM threats as they emerge and evolve. We have also deployed a second forward-based missile defense radar to Japan, which is operating today thanks to the hard work of the MDA and the Japanese government, to meet our goal of having the radar deployed by the end of 2014. This radar strengthens both homeland and regional defense.

This year's budget request also reflects Department of Defense's (DOD's) commitment to modernizing the GMD system. It will move us towards a more reliable and effective defense of the United States. It includes funding for development of a new radar that, when deployed in Alaska, will provide persistent sensor coverage and improve discrimination capabilities against North Korea. It also continues funding for the redesign of the kill vehicle for the Ground-Based Interceptor. Although we have fixed the causes of past failures in the GBI related to the Exoatmospheric Kill Vehicle, the redesigned kill vehicle will have greater performance and discrimination capability.

As directed by Congress, the MDA is also conducting environmental impact studies (EIS) at four sites in the eastern United States that could host an additional

GBI missile field. These EISs will be completed in 2016. The cost of building an additional missile defense site in the United States is very high. Given that the ICBM threat from Iran has not yet emerged, and the need to fix the current GBI kill vehicles, the highest priorities for the protection of the homeland are improving the reliability and effectiveness of the GBI and improving the GMD sensor architecture. The current GMD system provides coverage of the entire United States from North Korean and potential Iranian ICBMs. No decision has been made to deploy an additional missile field in the United States. If an ICBM threat were to emerge in numbers that necessitated the deployment of additional interceptors, the steps being taken now, to include conducting an environmental impact statement, will shorten the construction timelines associated with deployment of a new missile defense site.

REGIONAL DEFENSE

The Department's fiscal year 2016 budget request also continues to implement deployment of missile defenses that are tailored to the security circumstances in Europe, the Middle East, and Asia-Pacific. Our focus is on developing and fielding missile defense capabilities that are mobile and relocatable, which allows us to address crises as they emerge. We are also encouraging our allies and partners to acquire missile defense capabilities, and to strengthen operational missile defense cooperation. This year, we initiated a Joint Staff-led effort to update the 2012 Joint Capabilities Mix study to ensure that we are making the most effective regional missile defense investments possible. In a regional context, we know that we will not be able to purchase enough interceptors to rely purely on missile defense for the duration of a conflict. In such a situation, we must protect our most valuable assets while also drawing on our other capabilities to provide a comprehensive military approach to defeating the threat from ballistic missiles.

Europe

We are continuing to implement the European Phased Adaptive Approach (EPAA), and we are working in close collaboration with our North Atlantic Treaty Organization (NATO) Allies to develop an advanced network of sensors and interceptors—on land and at sea—to protect NATO European territory, our military forces, and facilities. Since 2011, the United States has operated a forward-based radar in Turkey and maintained a sea-based missile defense presence in Europe. The Aegis Ashore site in Romania is on schedule to be completed by the end of 2015. Two additional U.S. Aegis BMD destroyers, the USS *Carney* and USS *Porter,* will be joining USS *Donald Cook* and USS *Ross* later this year as they forward deploy to the naval facility at Rota, Spain. These multi-mission ships will support the missile defense mission, as well as other U.S. European Command and NATO maritime missions.

The President's budget request also supports the Aegis Ashore site that will be deployed in Poland in the 2018 timeframe and the development of the SM–3 Block IIA interceptor that will be deployed on land and at sea later this decade. As these capabilities become operationally available, they will extend BMD coverage to all NATO European territory.

Our NATO Allies are also making significant contributions to the European missile defense mission. Romania, Spain, and Turkey are hosting U.S. missile defense assets and provide the external security for the facilities. Beyond hosting the second Aegis Ashore site in Europe, Poland has also announced its intention to spend up to $10 billion to acquire advanced air and missile defense capabilities. DOD is engaging directly with Poland to assist it obtaining a lower-tier missile defense system to meet its missile defense requirements. The U.S. Patriot system is a finalist in this competition. Several other Allies are in the process of considering the purchase of air and missile defense capabilities. The United States will continue to encourage its NATO Allies to do more to cooperate and invest in missile defenses that will contribute to Alliance security.

Several Allies have modern surface combatant ships that could be equipped with BMD sensor or interceptor capability upgrades. The Netherlands and Denmark have committed to upgrading the SMART–L radars on their frigates to contribute to NATO BMD.

The Netherlands and Germany have committed Patriot PAC–3 systems to NATO missile defense as demonstrated through the ongoing NATO deployment in defense of Turkey. Spain recently replaced the Netherlands in the defense of the Turkey mission through deployment of a Patriot system, and is strengthening its air and missile defense capabilities by acquiring additional Patriot systems from Germany.

France is planning to provide its Spirale satellite detection system and a long-range radar for NATO territorial missile defense and has offered the SAMP/T air and missile defense system, which became operational in 2013, to NATO BMD.

The United States conducts exercises designed to hone our Alliance missile defense capabilities and integration. U.S. European Command (USEUCOM) is engaged with NATO in the development of a biennial NATO-led BMD exercise event that serves to reinforce and expand upon other, routine BMD training evolutions that take place on a quarterly and semi-annual basis.

Many NATO Allies also participate in NIMBLE TITAN, an unclassified, two-year, multinational, BMD campaign of experimentation. The overarching purpose of NIMBLE TITAN is to serve as a venue for collaboration, exchange of views, and coordination of BMD policy and operational development among participating nations and organizations, along with U.S. government agencies and military organizations. The NIBLE TITAN 16 campaign, which began last year, has 25 participating nations and organizations, including NATO.

Asia-Pacific

In the Asia-Pacific region, our force posture includes Aegis BMD capable ships, along with Patriot batteries deployed in Japan and South Korea. We have also maintained the THAAD battery deployment to Guam in response to North Korean provocation.

The cornerstone of our security and diplomacy in the region has been our strong bilateral alliances, including with South Korea, Japan, and Australia. All three of these nations play an important role in our regional efforts to achieve effective missile defense.

South Korea obviously has an immediate, proximate stake in preventing missile strikes from North Korea. We have worked closely with South Korea to ensure that our Alliance maintains the capacity to do just that. The United States deploys Patriot PAC–3 batteries in South Korea to defend U.S. and South Korean forces. In addition, South Korea is taking steps to enhance its own air and missile defense systems, which include sea- and land-based sensors and Patriot PAC–2 batteries. DOD has been consulting with South Korea about how it can upgrade its missile defense capabilities as part of an Alliance response to the growing North Korean missile threat.

Japan has its own layered missile defense system, which includes Aegis BMD ships with Standard Missile-3 interceptors, PAC–3 batteries, early-warning radars, and sophisticated command-and-control systems. Japan is upgrading two *ATAGO*-class Aegis destroyers to BMD capability with certification scheduled for fiscal year 2018 and fiscal year 2019, and plans to build two additional Aegis BMD ships, which would increase its inventory to a total of eight BMD-capable ships. As mentioned earlier, Japan also hosts two U.S. missile defense radars.

Additionally, Japan is a critical international partner for BMD development. One of our most significant cooperative efforts is the co-development of an advanced version of the SM–3 interceptor, the SM–3 Block IIA.

The United States and Australia have forged a longstanding partnership on missile defense research and development—most notably with regard to sensors. In addition, Australia is involved in a trilateral discussion on missile defense in the Pacific involving the United States, Australia, and Japan.

We will continue to emphasize the importance of developing a regional ballistic missile defense system that includes the sharing of sensor data among Allies to take full advantage of the benefits of system interoperability and integration.

Middle East

We also maintain a robust missile defense presence in the Middle East including land- and sea-based assets deployed in defense of our forward deployed forces, allies, and partners. This is in addition to our efforts to build the capacity of those allies and partners that will ultimately contribute to their ability to defend themselves.

The United States maintains a strong defense relationship with Israel, and our cooperation on missile defense has resulted in a comprehensive missile defense architecture. Israeli programs such as Iron Dome, the David's Sling Weapon System, and the Arrow Weapon System, in conjunction with operational cooperation with the United States, create a multi-layered architecture designed to protect the Israeli people from varying types of missile threats. Missile defense figured prominently in the AUSTERE CHALLENGE exercise we conducted with Israel in the fall of 2012, the largest U.S.-Israeli military exercise in history. A similar exercise, JUNIPER COBRA, is scheduled to take place in May of this year.

The United States is also working with a number of Gulf Cooperation Council (GCC) countries on missile defense, including supporting the purchase of missile defense systems through the Foreign Military Sales program. The United Arab Emirates is procuring the Terminal High Altitude Area Defense (THAAD) system, with the first delivery expected later this year. This is in addition to the UAE's earlier

purchase of Patriot systems, which have been delivered. Saudi Arabia is in the process of upgrading its existing Patriot PAC–2 batteries to the PAC–3 configuration. Kuwait is also purchasing Patriot PAC–3 batteries. Qatar also joined the international community of U.S. Patriot partners late last year—a community which also includes Saudi Arabia and Kuwait in addition to the UAE.

U.S. Air Force Central Command maintains a series of regular exchanges between United States and GCC air defense officers at the Combined Air Operations Center located at Al Udeid Air Base in Qatar. These exchanges provide an opportunity for increased situational awareness of missile threats in the region as well as the potential for future BMD planning and operational cooperation.

As the GCC states begin to field more capable systems, the United States and its Gulf partners must work toward greater integration of those capabilities across the region. The desired end state is a regional missile defense architecture in which GCC member states participate and contribute to the extent practical, leading to a networked, layered defense of key strategic centers that strengthens deterrence and increases our collective ability to defeat a ballistic missile attack.

Technology Development

We must continue to look ahead. This means ensuring that our investment strategy and priorities balance the needs of addressing the most dangerous threats we confront today while positioning us to respond to threat developments in the next decade. Areas for priority technology investment include persistent discrimination in the current and future Ballistic Missile Defense System sensor architecture; high power lasers for multiple BMD applications; common kill vehicle technology leading to a multi-object kill vehicle; advanced technology for high risk/high pay-off breakthroughs; and a rail gun to lower the cost per kill.

Conclusion

The austere budget environment will continue to compel us to make difficult choices here. Sequestration would undermine our ability to improve the GBI fleet, emplace new and more advanced sensors, and defend our deployed forces and Allies against ballistic missile attack. Quite simply, it would hinder our ability to keep up with the growing threat. We cannot let our guard down at any time, much less in the current security environment. I urge you to repeal sequestration before it causes irreparable damage to the nation's missile defenses.

Thank you for having me here today, and I look forward to your questions.

Chairman SESSIONS. Thank you.

Admiral Syring?

STATEMENT OF VICE ADMIRAL JAMES D. SYRING, USN, DIRECTOR, MISSILE DEFENSE AGENCY DEPARTMENT OF DEFENSE

Admiral SYRING. Thank you, Chairman Sessions, Ranking Member Donnelly, Senator King, Senator Fischer. I appreciate the opportunity to testify today in front of you. I will be very brief in my opening statement.

Our budget request for fiscal year 2016 maintains the commitment to operate and sustain our homeland defenses, including the planned deployment of 44 GBIs by the end of 2017 and GBI fleet reliability enhancements. As was noted, we will also continue development of the Redesigned Kill Vehicle for improved reliability, availability, performance, and producibility, with initial deployment after successful testing planned in 2020.

We anticipate contract award for the long-range discrimination radar development, deployment, and initial operation before the end of 2015 with fielding by 2020.

For regional missile defense, our 2016 budget request supports the continued procurement of the SM–3 IB and THAAD interceptors. Also, the Aegis Ashore site in Romania will be completed by the end of 2015, and we are on track to deploy Aegis Ashore Poland by the end of 2018.

Finally, will continue our discrimination sensor, weapons technology, directed energy, Common Kill Vehicle, and other technology maturation initiatives at an increased rate in this budget request. These investments will help us deploy a future BMDS architecture more capable of discriminating and killing reentry vehicles with a high degree of confidence.

Mr. Chairman, members of the subcommittee, this is a sound budget request. I believe our Nation is well-defended and that our missile defense programs are on track to improve protection for our deployed forces, allies, and friends with the support of this budget.

Thank you, sir, and I look forward to your questions.

[The prepared statement of Admiral Syring follows:]

PREPARED STATEMENT OF VICE ADMIRAL J.D. SYRING, USN

Good afternoon, Chairman Sessions, Ranking Member Donnelly, distinguished Members of the subcommittee. I appreciate this opportunity to testify before you today. Our current budget request of $8.127 billion for fiscal year (FY) 2016 will continue the development of defenses for our Nation, deployed forces, allies, and international partners against increasingly capable ballistic missiles. The fiscal year 2016 missile defense program will continue to support the warfighter and needs of the Combatant Commands (COCOMs) with the development and deployment of interceptors, sensors, and the command, control, battle management and communications (C2BMC) system for the integrated Ballistic Missile Defense System (BMDS). Our request for fiscal year 2016 will improve and expand homeland and regional missile defenses and invest in advanced technology development and future capabilities to counter the increasingly complex threat.

BALLISTIC MISSILE THREAT

The threat continues to grow as our potential adversaries acquire a greater number of ballistic missiles, increasing their range, incorporating BMD countermeasures, and making them more complex, survivable, reliable, and accurate. Space-launch activities involve multistage systems that further the development of technologies for intercontinental ballistic missiles (ICBMs). In addition to the Taepo Dong 2 space launch vehicle/ICBM, North Korea is developing and has paraded the KN08 road-mobile ICBM and an intermediate-range ballistic missile (IRBM) capable of North Korea conducted multiple short- and medium-range ballistic missile launches and threatened to conduct additional longer-range launches. Today it fields hundreds of Scud and No Dong missiles that can reach U.S. forces forward deployed to the Republic of Korea and Japan.

Iran has publicly stated it intends to launch a space launch vehicle as early as this year (2015) that could be capable of intercontinental ballistic missile ranges if configured as such. Iran also has steadily increased its ballistic missile force, deploying next-generation short- and medium-range ballistic missiles (SRBMs and MRBMs) with increasing accuracy and new submunition payloads. Tehran's overall defense strategy relies on a substantial inventory of theater ballistic missiles capable of striking targets in southeastern Europe. Iran continues to develop more sophisticated missiles and improve the range and accuracy of current missile systems, and it has publicly demonstrated the ability to launch simultaneous salvos of multiple rockets and missiles. Demonstrating it is capable of modifying currently deployed ballistic missile systems, Iran has flight-tested a Fateh-110 ballistic missile in an anti-ship role. By adding a seeker to improve the missile's accuracy against sea-based targets, Iran could threaten maritime activity throughout the Persian Gulf and Strait of Hormuz.

SUPPORT FOR THE WARFIGHTER

Our overriding goal is to support the warfighter, which includes delivering greater missile defense capability and capacity. With this budget we will maintain our commitment to build out homeland defenses to 44 Ground Based Interceptors (GBIs) by the end of 2017. We also will maintain our commitment to deploy Phases 2 and 3 of the deployment of Standard Missile-3 (SM–3) Block IB missiles and SM–3 Block IIAs (first available in 2018) on ships and at Aegis Ashore sites in Romania (2015) and Poland (2018). We currently have 33 Aegis BMD ships, on the way to 35 by the end of fiscal year 2016. We are continuing efforts to improve the performance

of the Aegis Weapons System and plan to procure a total of 209 SM–3 Block IBs by the end of fiscal year 2016. We announced a Technical Capability Declaration this past December for the second forward-based X-band AN/TPY–2 radar in Japan, which improves homeland and regional defense capabilities and increases our global operational AN/TPY–2 radar posture. By the end of fiscal year 2016, MDA is scheduled to deliver 48 additional Terminal High Altitude Area Defense (THAAD) interceptors, for a total of 155 interceptors fielded, and we are continuing our support of the operational Guam THAAD battery.

Last year we conducted or participated in several multi-event exercises and wargames, which are critically important to the warfighter and the intensive engineering efforts across the Agency. In response to the continued fielding by U.S. adversaries of air, missile, and rocket capabilities, as Technical Authority for Integrated Air and Missile Defense (IAMD), MDA is leading the integration of evolving MDA, Service, and COCOM command and control capabilities through systems engineering analysis and development of technical integration requirements and interface control documents. Other IAMD initiatives include integrating C2BMC with the Army's Integrated Battlefield Control System (IBCS) to exchange ballistic missile data and exploring THAAD integration within the IBCS Army architecture.

(DOT&E), independent testers, and the Services to develop an Integrated Master Test Plan (IMTP) to execute a robust, cost-effective flight test program that features operationally realistic conditions and integrates U.S. government stakeholders—to include Soldiers, Sailors, Airmen, and Marines—and allies to prove BMD capabilities. We have entered a period of unprecedented testing complexity and increased testing tempo. Our flight tests will involve increasingly stressful threat representative targets as well as longer range interceptors for our homeland and regional capabilities. From October 2013 to the present, we have executed seven high profile flight tests. In fiscal year 2015 we will conduct 12 flight tests, and in fiscal year 2016 seven flight tests.

HOMELAND DEFENSE

MDA remains committed to operating, sustaining, and expanding our nation's homeland missile defenses and requests $1.76 billion for the Ground-based Midcourse Defense (GMD) program, or $613 million over our PB 2015 request. This budget request will allow us to grow the number of currently deployed Ground Based Interceptor (GBI) fleet to 44 by the end of 2017, continue flight and system ground testing, continue Redesigned Kill Vehicle (RKV) development, enhance the Stockpile Reliability Program, modify the current booster to increase survivability and hardness to support RKV integration and expand the battle space to enable later GBI engagements, upgrade the GMD ground system, and deploy upgraded GMD fire control software to enhance our ability to use land-based sensor discrimination data.

The successful FTG–06b intercept test this past June allowed us to assess the performance and interoperability of homeland defense weapon systems, including BMD ship acquired an Intermediate Range Ballistic Missile (IRBM) target and forwarded the track through C2BMC to the GMD fire control system, which developed a weapon task plan that the warfighter used to launch a GBI. The SBX acquired the target objects and forwarded precision tracks with discrimination data through the GMD ground system to the in-flight GBI. The interceptor used SBX data to locate the target objects, complete discrimination, and successfully intercept the target. Our analysis indicates that all components of the system performed as designed. This was the first flight test of an operationally configured GBI that demonstrated the ability to correctly discriminate and intercept the reentry vehicle in the presence of countermeasures. FTG–06b also demonstrated that a Capability Enhancement-II (CE–II) exo-atmospheric kill vehicle (EKV) with a cradled Inertial Measurement Unit dampens the vibration environments experienced during the failure of the FTG–06a flight test conducted in December 2010. With this successful flight test we were able to resume production of eight planned GBIs in the proven FTG–06b configuration.

We are implementing several fixes to address the failed FTG–07 flight test in July 2013. While the GBI was in flight, a voltage shift caused by battery electrolyte leakage shut down the flight computer and prevented EKV separation. We developed EKV software for CE–I GBIs, which includes a capability to reset and recover the flight computer following a voltage shift. This software was fully tested and is now fielded to all deployed CE–Is. New battery and ground ties, once tested, will be incorporated in the CE–II Block 1 deliveries beginning in fiscal year 2016.

The next flight test of the GMD system will take place late this year. GM CTV –02+ is a non-intercept test of a CE–II GBI to demonstrate the performance of alternate divert thrusters in a flight environment and test end-to-end discrimination of

a complex target scene through the GMD fire control loop. The EKV will use Aegis BMD SPY–1, SBX, and AN/TPY–2 data for target selection. Data collected from this test will be used to evaluate Discrimination Improvements for Homeland Defense (DIHD) objectives. At the end of calendar year 2016 we plan to conduct FTG–15, which will be the first intercept flight test for the CE–II Block 1 GBI and the first intercept of an ICBM range target. Following a successful intercept, the plan is to deliver 10 CE–II Block 1 GBIs over the next year to achieve our goal of 44 GBIs by the end of 2017.

In addition to increasing the operational fleet from 30 to 44 GBIs by 2017, MDA will complete the refurbishment and reactivation of Missile Field 1 at Fort Greely by 2016 to provide sufficient silos for 44 GBIs. We will deliver eight new CE–IIs in 2015, upgrade eight currently fielded CE–IIs in 2016, and deliver 10 new CE–II Block 1 GBIs in 2017. Four previously fielded CE–II GBIs will be used for flight and Stockpile Reliability testing.

MDA completed a GBI Fleet Assessment last year that pointed out the need for improvements in reliability of the EKV, GBI, and ground systems, and we will continue to implement its findings in fiscal year 2015 and beyond. We have introduced an enhanced Stockpile Reliability program to better understand the service life and reliability of the fielded fleet and are conducting design and reliability analysis on the fielded CE–IIs and booster to establish performance margins. We are analyzing the GBIs to identify potential failures modes and reliability risks so that we can conduct the right ground development of the next GBI with a Redesigned Kill Vehicle.

We will continue development of a Redesigned Kill Vehicle (RKV) for initial deployment in 2020. The RKV will be a modular design using mature subassemblies and components to improve reliability, maintainability, producibility, and affordability when compared to the current EKV. The program will perform full qualification and reliability testing of components and subassemblies. The RKV will incorporate performance enhancements in target acquisition and discrimination and include on-demand communications. On-demand communications enables better use of off-board sensor data and provides improved situation awareness for the warfighter. The RKV also will include survivability enhancements. The first flight test of the RKV is planned for 2018, and the first intercept test is planned for 2019. We will acquire two additional boosters beginning in fiscal year 2016 to support RKV flight tests.

This year we will finish construction of the GBI In-Flight Interceptor Communication System (IFICS) Data Terminal (IDT) at Fort Drum, New York. The east coast IDT will enable communication with GBIs launched from Fort Greely, Alaska and Vandenberg Air Force Base in California over longer distances and improve defenses for the eastern United States.

MDA will implement upgrades to the GMD ground system to improve reliability, maintainability, and eliminate obsolescence problems. The existing GMD ground system was built in 2004 using technology developed in the 1990s. Without an upgrade, the ground system reliability would decay and impact GBI availability to the warfighter. Phase I will upgrade the GBI command launch equipment, GMD fire control Phase II upgrades the GMD communications network and launch systems equipment and modifies the IFICS data terminal to support on-demand communications with the RKV by 2020.

Working with our Japanese partners, we completed the deployment of the AN/TPY–2 radar in Kyogamisaki in southern Japan to complement the radar currently operating in Shariki in northern Japan. This radar and a new C2BMC capability will enhance the overall performance of the Kyogamisaki and Shariki radars when operating in a mutually supporting AN/TPY–2 dual radar mode. We made a Technical Capability Declaration for the Kyogamisaki radar this past December. Together with the Shariki AN/TPY–2 radar in the north, the new radar will enhance the ability to defend our forward deployed forces, Japan, and the U.S. homeland from ballistic missile attack by providing improved tracking coverage for launches out of North Korea.

We will continue missile defense upgrades of the Early Warning Radars in Clear, Alaska and Cape Cod, Massachusetts. We expect to complete the Clear radar upgrade in 2017 and the Cape Cod upgrade in 2018. In fiscal year 2016 we will continue to support flight testing with the SBX to demonstrate improvements to discrimination and debris mitigation. Our budget request of $72.9 million for SBX includes funds for improving reaction time and conducting contingency operations for defense of the homeland. We also plan to support a near-term discrimination capability in 2016 and fielding near-term discrimination improvements for homeland defense in 2020 to enhance the tracking and discrimination capabilities of currently deployed sensors.

Range Discrimination Radar (LRDR), the new midcourse tracking radar that will provide persistent coverage and improve discrimination capabilities against threats to the homeland from the Pacific theater. LRDR will provide larger hit assessment coverage enabling improved warfighting capability to manage GBI inventory and improving the capacity of the BMDS. We have completed technical trade studies and defined requirements for the LRDR and started acquisition planning and pre-construction activities. MDA has released a Request for Proposal (RFP) for the development, deployment, and initial operation of the LRDR. We anticipate contract award before the end of fiscal year 2015. In fiscal year 2016 we plan to conduct a System Requirement Review and Preliminary Design Review. MDA worked closely with Air Force Space Command to verify LRDR's inherent capabilities to support the space situational awareness (SSA) mission. The Command is jointly exploring system design and operations alternatives to maximize the exploitation of LRDR's inherent SSA capabilities. Air Force Space Command envisions using LRDR to augment the Space Surveillance Network capabilities as a secondary mission if it proves viable.

A Continental United States (CONUS) Interceptor Site (CIS) study, conducted in accordance with Section 227 of the fiscal year 2013 National Defense Authorization Act, determined the following sites were viable candidates to be included in the Environmental Impact Statement (EIS): Fort Drum, New York; Portsmouth SERE Training Area, Maine (Rangley); Camp Ravenna, Ohio; and Fort Custer Combined Training Center, Michigan. The Department is conducting EIS activities that will evaluate each of the four candidate sites, to include potential impacts to land use, water resources, air quality, transportation, socioeconomics and other factors established by the National Environmental Policy Act. The EIS will take approximately 30 months and should conclude in 2016. There has been no decision by the Department to move forward with an additional CONUS interceptor site. The current GBI sites at Fort Greely and Vandenberg AFB provide capability necessary to protect the U.S. homeland against the current and projected ICBM threat from North Korea as well as the future Iranian ICBM threat should it emerge. Even though an additional CONUS interceptor site would add battle space and interceptor capacity, a decision to construct the new site would come at a significant material development and service sustainment cost. Near-term, upgrading the kill vehicle on the GBI and enhancing the homeland defense sensor network are higher priorities and prerequisites for improving protection against limited ICBM attack.

REGIONAL DEFENSES

Deployment of regional defenses to protect our deployed forces, allies and international partners remains one of our top priorities. Our fiscal year 2016 budget request funds the continued development and deployment of defenses against SRBMs, MRBMs, and IRBMs in support of Combatant Commanders' near-term and future priorities and supports the President's commitment to EPAA.

Terminal High Altitude Area Defense

Today, four Terminal High Altitude Area Defense (THAAD) Weapon System Batteries are delivered, with the fifth planned for activation this year. To meet the demand from combatant commanders for THAAD, in fiscal year 2014, MDA accelerated procurement of THAAD Battery 7 for delivery in fiscal year 2017, two years earlier than Software Build 1.4, which includes critical updates to weapon system components and Information Assurance update. MDA also continued its support of the first deployed THAAD battery in Guam, exceeding the Army's required operational readiness rate.

This year THAAD will participate in two flight tests, FTT–18 and FTO–02. In FTT18 THAAD will demonstrate an intercept of a separating IRBM target using the THAAD radar, launcher, fire control and communication, interceptor operations and engagement functions. In FTO–02, Event 2, THAAD will engage a SRBM and demonstrate advanced radar algorithms. During this operational test of our regional defense architecture, which will include the attempted intercept of an MRBM and air-breathing target by Aegis BMD, THAAD will demonstrate a layered defense capability.

For fiscal year 2016, MDA is requesting $464.1 million for THAAD procurement, which includes the purchase of 30 THAAD interceptors and procurement of training devices for the THAAD institutional training at Fort Sill, OK. By the end of fiscal year 2016, MDA will deliver an additional 48 THAAD interceptors to the U.S. Army, for a total of 155 interceptors delivered. We will continue to support the forward deployed THAAD battery in Guam. We are requesting $228.0 million in RDT&E funding in fiscal year 2016 as part of the continued development of THAAD capabilities, and begin concept development and risk reduction activities for THAAD follow-on capabilities. These activities will explore and mature the design concept of

expanding THAAD system interoperability with air and missile defense systems, and expanding the battlespace and defended area of the current baseline THAAD Weapon System. We are also batteries.

Aegis Ballistic Missile Defense

In fiscal year 2014, MDA continued to expand global BMD capability for the Aegis Fleet. Together with the U.S. Navy, we completed four BMD Weapons System installations on Aegis ships—one Aegis BMD 3.6 ship and three Aegis BMD 4.0 ships—and we commenced upgrades on existing BMD ships, two from 3.6 to 4.0 and one from 3.6 to Aegis Baseline 9.C1 with BMD 5.0CU. We now have a total of 33 BMD capable Aegis ships in the Fleet. We continued delivery of Standard Missile-3s to the Fleet, including 29 Block IAs and 26 Block IBs.

In fiscal year 2014, MDA conducted several critical flight tests to prove the operational capability of the Aegis BMD weapon system. In FTM–22, we successfully engaged and destroyed an MRBM target using the Aegis BMD 4.0 weapon system and an SM–3 Block IB. This test exercised the second-generation Aegis BMD 4.0 weapon system and supported production decisions for the SM–3 Block IB by completing developmental and operational testing for both the weapon system and missile. With the successful completion of DOT&E testing requirements, Aegis BMD 4.0 and the SM–3 Block IB were found to be operationally suitable and effective. FTM–22 was also the final flight test executed by the USS *Lake Erie,* the BMD test ship for over 10 years.

We also brought ballistic missile defense flight testing back to the east coast in fiscal year 2014. In FTX–18 we successfully simulated engagements against a raid of three short-range targets using the Aegis BMD 4.0 Weapons System and simulated SM–3 environment off the coast of Virginia at NASA's Wallops Island facility.

As construction began at the Aegis Ashore site in Romania, we conducted the first Controlled Test Vehicle at the Aegis Ashore Missile Defense Test Complex at the Pacific Missile Range Facility (PMRF) in Kauai, HI. This flight test proved the design of the Aegis Ashore system and the ability to launch an SM–3 from land. The first Aegis Ashore intercept test from PMRF will occur in the third quarter of this year to support turn-over of the Romanian site to the Navy for operation.

In its homeland defense role, Aegis BMD executed long range surveillance and track to provide data for the GBI launch in FTG–06b. In the test, USS *Hopper,* with the BMD 4.0 weapon system, acquired the target and sent track data to the BMDS Command, Control, Battle Management and Communications system, directly contributing to successful intercept of the target.

This past fall we conducted two operationally representative tests for certification of the Navy's Aegis Modernization Baseline 9 weapon system. In FTX–20, we used our new MRBM target to exercise several BMDS sensors and C2BMC. This was also the first tracking exercise for the new Navy/MDA Integrated Air and Missile Defense Baseline 9 test ship, USS *John Paul Jones.* A couple of weeks later, in FTM–25, USS *John Paul Jones* launched an SM–3 Block IB to intercept an SRBM target while simultaneously launching two SM–2 Block IIIAs against two air-breathing threats, successfully exercising the Navy's Integrated Air and Missile Defense capability inherent in Baseline 9.

In fiscal year 2016, we will continue our commitment to develop, test, and deliver global naval capability to the warfighter and support defense of our deployed forces and NATO in fiscal year 2016 to procure 40 SM–3 Block IBs, for a total of 209 procured and 107 delivered by the end of fiscal year 2016. In anticipation of fiscal year 2016 and beyond Multiyear Procurement Authorization for the SM–3 Block IB, MDA requests $147.8 million in economic order quantity for missile components for fiscal year 2016–19 Block IB multiyear procurements. By moving to a multiyear procurement, we may realize an estimated cost savings of up to 14 percent across the FYDP. To recertify SM–3 rounds which have been previously delivered and deployed to the Fleet, MDA requests $19.8 million for sustainment of these assets.

We request $172.6 million for the SM–3 Block IIA cooperative development effort with the Japan Ministry of Defense. In fiscal year 2014, the SM–3 Block IIA completed Propulsion Test Vehicle-01, in which the missile and new composite canister both demonstrated successful and safe ignition and egress from the vertical launching system. Upon completion of this test and the system level critical design review, the SM–3 Block IIA transitioned into the integration and testing phase and will execute the first controlled test vehicle flight test in third quarter fiscal year 2015. Along with a total of five flight tests for the SM–3 Block IIA through fiscal year 2018, fiscal year 2016 will focus on an extensive ground test campaign to prove system design and missile capability. We are committed to delivering the SM–3 Block IIA to the Fleet to meet global threat requirements, and specifically to support EPAA Phase 3.

MDA is strongly committed to further enhancing capability of the Aegis BMD weapon system to give Sailors the tools needed to successfully execute their mission. MDA requests $40.7 million for the BMD 4 series weapon systems to bring advanced 5.0CU development, MDA has prioritized delivering BMD 5.1 capability on schedule and requests $180.6 million to continue software development and testing to certify in fiscal year 2018 and meet the delivery timeline of the SM–3 Block IIA missile for deployment on ships and at Aegis Ashore sites. In addition to weapon system development, MDA requests $110.9 million to procure weapon system equipment for installation and upgrade to the BMD Fleet and $12.6 million to sustain BMD specific equipment on the existing Fleet.

We also continue development of a Sea Based Terminal capability to provide protection of maritime forces against observed or demonstrated advanced anti-ship ballistic missiles and increased layered defense for forces ashore. Using an incremental development approach, we are incorporating BMD capability into the Navy's Baseline 9 architecture, to include terminal defense with the SM–6 guided missile and the BMD 5 series weapon systems. In 2014, we completed Sea Based Terminal Increment 1 missile (SM–6 Dual I) software build 1, and we demonstrated its performance in a simulated environment. We plan to test and certify the first increment of Sea Based Terminal capability in fourth quarter fiscal year 2015 in four Multi-Mission Warfare events, with follow-on performance testing in fiscal year 2016. Sea Based Terminal Increment 2 is on schedule to be certified and operational in 2018.

European Phased Adaptive Approach

We will continue to expand the EPAA to provide additional coverage of European NATO territory from Iranian ballistic missile threats by investing resources for EPAA development, testing and deployment. EPAA Phase 1 was implemented in 2011 with Eastern Mediterranean.

MDA is on schedule to deliver EPAA Phase 2 by the end of 2015, which will enhance U.S. and NATO capabilities with the addition of more capable Aegis BMD SM3 Block IBs and upgraded Baseline 9 weapon system with BMD 5.0CU. Phase 2 will include deployment of Aegis Ashore to Romania with capability to launch both SM–3 Block IA and IB variants and upgraded versions of the Aegis BMD weapon system. Required military construction, installation, integration and testing activities will be complete for technical capability declaration in 2015. After having tested the system at the Moorestown, New Jersey site in 2014, the deckhouse, including all weapon system equipment was disassembled, packed and shipped to Romania. MDA requests $33.4 million in fiscal year 2016 to complete site activation, integration, and testing of the system in-country and to maintain the test site at PMRF to support system-wide testing for Phase 2 deployment. We are on track to turn over Aegis Ashore Romania to the Navy, and in fiscal year 2016 we have requested $13.9 million for sustainment of the system once it is operational. MDA also completed installations and upgrades to the BMD-capable multi-mission ships that are shifting homeports from Norfolk, VA to Rota, Spain, which will support the EPAA Phase II architecture. The homeport transfer of four multi-mission Aegis BMD ships to Rota, Spain began in 2014 with the USS *Donald Cook* and USS *Ross*. The remaining two Aegis BMD ships, USS *Porter* and USS *Carney,* will transfer this year.

EPAA Phase 3 will improve defensive coverage against medium- and intermediate-range threats with the deployment of a second Aegis Ashore site in Block IIAs. Construction at Redzikowo, Poland is expected to begin in fiscal year 2016. We request $30.6 million in fiscal year 2016 for procurement of Aegis Ashore equipment and $169.2 million for the construction of the Aegis Ashore site in Poland. We need this funding to complete this site by the end of 2018.

Command, Control, Battle Management, and Communications and Sensors

C2BMC provides persistent tracking, cueing, discrimination, and fire control quality data to Aegis BMD, GMD, THAAD, and coalition partners to support homeland and regional defense objectives. Last June we successfully forwarded Aegis BMD system track data through the C2BMC system to the GMD fire control system during FTG–06b. We continue to support warfighter command and control and battle management needs across the globe by providing the strategic BMD planner, which provides Combatant Commanders situational awareness tools to support weapons release authority for homeland defense and control and tasking of forward-based AN/TPY–2 radars. C2BMC operators and maintainers are deployed forward in some of the world's highest threat spots and continue to provide around-the-clock support to the local commanders. As the BMDS integrating element, C2BMC has also demonstrated proven interoperability across regional BMD architectures.

In addition to continuing the enhancement of global BMD survivable communications and support for operations and sustainment of C2BMC at fielded sites, this

year we will integrate Space Based Infrared System Increment 2 capabilities into C2BMC to support cueing of BMD sensors worldwide. We have initiated a Space Based Kill Assessment (SKA) demonstration that will host sensors on commercial and pass that information on to the BMDS to support a multi-sensor kill assessment of the target.

The Services and COCOMs, with logistical support from MDA, are operating forward based X-band radars (AN/TPY–2(FBM)) in Japan, Israel, Turkey, and United States Central Command. All of these radars contribute to regional defense, and some, including the second AN/TPY–2 radar deployed to Japan last year, also provide a significant contribution to the defense of the U.S. homeland. Last year we also continued our AN/TPY–2 (Terminal Mode) support to warfighters on Guam. We accepted AN/TPY–2 Radar #9, providing it to THAAD Battery #4, and AN/TPY–2 Radar #10. We also awarded a production contract for AN/TPY–2 Radar#12, and for additional spares. In fiscal year 2016 we plan to develop and test advanced discrimination algorithms to counter evolving threats to provide additional capability to the Combatant Commanders as well as close Materiel Release conditions for the Terminal Mode and Forward-Based Mode AN/TPY–2 radars. We plan to deliver Radar #10 to THAAD Battery #6, start production of an Antenna Equipment Unit Float, and complete production of AN/TPY–2 Radar #12, which will be allocated to THAAD Battery #7.

We request $536.5 million in fiscal year 2016 to develop, deploy and test BMDS sensors (includes $138 million for the continued development of the Long Range Discrimination Radar), and $187.5 million to sustain the nine AN/TPY–2 radars and support the UEWRs and Cobra Dane radar. We will continue communications support for the AN/TPY–2 radars and C2BMC upgrades. We request $450.1 million in fiscal year 2016 to develop, test, field, sustain, and operate all C2BMC spirals. We also will integrate capabilities of C2BMC to provide fire control quality data to BMD weapon systems in support of homeland and regional defense. We request $31.6 million for continued operation of the Space Tracking and Surveillance System in fiscal year 2016.

DEVELOPING NEW CAPABILITIES

MDA is developing fiscally sustainable, off-setting technologies to address gaps in the BMDS and extend our dominance in missile defense. MDA's goal for these investments is to deploy a future BMDS architecture more capable of discriminating and destroying a reentry vehicle with a high degree of confidence.

In 2014 and 2015, the warfighters emphasized the importance of improving discrimination capability, the missile defense function that distinguishes between lethal and non-lethal objects, in order to reduce the need for large, unaffordable interceptor inventories. Radars and electro-optical/infrared (EO/IR) sensors are central to this capability. However, sensors require sufficient sensitivity and resolution to measure features useful for inferring which objects are lethal or non-lethal. Between now and 2020, we will use available technology to improve existing sensors, battle management and fire control, and kill vehicles. After 2020, our plan is to field new advanced EO/IR sensors and upgrade discrimination capabilities based on our new technology investments.

Relying purely on terrestrial radars for precision tracking and discrimination of the threat is a potential weakness the enemy could exploit in the future. Adding persistent electro-optical sensors to the BMDS architecture is a high payoff solution for this gap. Last fall during FTM–25 we accelerated the Discrimination Sensor Technology flight test program by nearly six months to prove that our Aegis Weapon System could launch a Standard Missile based solely on tracks generated by remote sensors on Unmanned Aerial Vehicles (UAVs). MDA requests $28.2 million for our Discrimination Sensor Technology development and test plan to provide a cost-effective, stepping stone towards our goal of achieving persistent discrimination coverage of enemy missiles in all theaters, including ICBMs targeting the homeland. In fiscal year 2016, we plan to upgrade UAV-borne sensors and demonstrate even greater discrimination capability in conjunction with Aegis flight testing in the first quarter fiscal year 2017 as a precursor to the development and test of a prototype advanced sensor under our Technology Maturation Initiatives program element.

We request $45.4 million in Weapons Technology to continue development, integration, and testing of our high-powered directed energy program to build the foundation for the next-generation UAV-borne laser system. A UAV-borne laser would be capable of acquiring, tracking and eventually destroying an enemy missile at a much lower cost than the existing BMDS. Within the Directed Energy project, we will develop and demonstrate the technology necessary to scale laser power jointly with our Air Force and DARPA partners. The Massachusetts Institute of Tech-

nology's Lincoln Laboratory (MIT/LL) Fiber Combining Laser achieved 34 kilowatts continuous power in October 2014, a record for fiber combined lasers. The Lawrence Livermore National Laboratory (LLNL) achieved similar success with their Diode Pumped Alkali Laser system, reaching five kilowatts last year. In our effort to mature high altitude, low Mach UAVs for directed energy applications, we successfully completed five Phantom Eye flights at the Air Force's Edwards Flight Test Center in California. The Phantom Eye data from launch to landing.

In fiscal year 2016, MIT/LL will conduct a Fiber Combining Laser critical design review and begin fabrication and integration of a lighter, more compact Fiber Combining Laser system, driving the weight of the system down from five kilograms per kilowatt to one kilogram per kilowatt. LLNL will demonstrate a DPAL system at 30 kilowatts average power, six times more powerful than ever achieved by a hybrid laser.

Within the Interceptor Technology project, MDA develops technology to enhance the hit-to-kill capability within current and future BMDS architectures. MDA will invest in cutting edge technology for the competitive development of the next generation, solid Divert and Attitude Control System (DACS) for the Multi-Object Kill Vehicle. We will also investigate the suitability of rail gun technology for missile defense missions.

MDA requests $96.3 million for Technology Maturation Initiatives to build on the successes in weapons technology and discrimination sensor technology. Airborne discrimination sensors and low power tracking lasers are sufficiently mature to develop flight prototypes that address complex tracking and discrimination challenges from evolving threats to the homeland. In fiscal year 2016, MDA will incorporate an advanced sensor into the tactically proven Multispectral Targeting System and MQ–9 Reaper combination to prove precision track and discrimination performance of airborne sensors at strategic ranges, or thousands of kilometers. MDA will also contract with industry for the design of a UAV-borne laser demonstrator to quantify the target acquisition, tracking, and handover performance required for boost phase missile defense under realistic conditions.

MDA requests $46.7 million for the Common Kill Vehicle Technology effort. Last year, we began the first phase of a two phase, development strategy for the next generation of our exo-atmospheric kill vehicles. In that first phase, we defined concepts and developed requirements for a new Redesigned Kill Vehicle for our ground-based interceptor program. In fiscal year 2016, we are implementing phase II of that strategy during which we will work jointly with industry to define concepts for deploying multiple kill vehicles from a single booster. This year we plan to award several contracts with industry to define concepts for Multi-Object Kill Vehicles (MOKV). In parallel, we will reduce technical risk in several areas that are critical to making this revolutionary concept a reality. For example, we will develop and test, by 2017, MOKV command and control strategies in both digital and Hardware-in-the-Loop venues that will prove we can manage the engagements of many kill vehicles on many targets from a single interceptor. We will also invest in the communication architectures and guidance technology that support this game changing approach. Ultimately, these Multi-Object Kill Vehicles will revolutionize our missile defense architecture, substantially reducing the interceptor inventory required to defeat an evolving and more capable threat to the Homeland.

MDA requests $17.4 million for Advanced Research and development that capitalizes on the creativity and innovation of the Nation's small business community and academia to enhance the BMDS. We are also fostering research between U.S. and foreign universities of allied nations through international cooperative science and technology projects. We awarded 216 new contracts for innovative new research in eight missile defense related topics last year.

MDA also requests $12.1 million for the Advanced Concepts & Performance Assessment effort, which models the capability of advanced BMD technology to address evolving threats to the warfighter. The request will fund the digital simulation and hardware-in-the-loop framework and models required for testing of the Airborne Advanced Sensor, Kill Vehicle Modular Open Architecture test bed, and maturing sensor fusion algorithms.

INTERNATIONAL COOPERATION

The fiscal year 2016 budget request includes funding for regional missile defense capabilities in order to protect U.S. forces, reassure allies and partners, and build cooperative regional security architectures. MDA is engaged with over twenty countries and international organizations, such as NATO. MDA remains committed to expanding work with our international partners, to include conducting joint analyses to support partner missile defense acquisition decisions, cooperative research

and development projects, deployments, Foreign Military Sales (FMS), and co-production. Our major international efforts reflect the Department's goals in the Asia-Pacific, Middle East, and Europe and will help implement EPAA, build partner BMD capacity, and support the strategic shift to Asia-Pacific.

As allies and partners invest in their own missile defense capabilities, this will enable us to build more effective regional security architectures and complement U.S. regional missile defense capabilities. MDA is currently executing an FMS case with the United Arab Emirates for two THAAD batteries and accompanying launchers, radars, and interceptors. This calendar year, we will deliver the first THAAD battery to our UAE partners to begin New Equipment Training. We continue to be actively engaged with cost data that may inform future decisions to procure THAAD.

We continue to have a very strong cooperative missile defense partnership with Israel. In fiscal year 2014 the Israel Missile Defense Organization (IMDO) and MDA achieved a second successful intercept using the David's Sling Weapon System to defeat shorter-range ballistic missiles and conducted the second fly-out of the Arrow-3 upper tier interceptor, demonstrating its key functional capabilities in-flight. Arrow-3 is intended to intercept longer-range threats. The Arrow Weapon System 2 is a currently fielded capability operated by the Israeli Air Force. This past September, IMDO and MDA conducted an intercept test of the Arrow-2 interceptor missile against a MRBM target over the Mediterranean. The Department also reached agreement in March 2014 with Israel regarding coproduction of the Iron Dome defense system. The agreement garnered approximately $263 million in U.S. work share for coproduction of Iron Dome components. We are requesting $55.0 million to procure Iron Dome radars and associated equipment.

MDA and our Japanese counterparts continue to make significant progress with the SM–3 IIA interceptor, our largest co-development effort. This development work, which remains on track for first delivery in the 2018 time frame, would expand extended deterrence to our friends and allies and establish an important vehicle for closer defense cooperation ties. These cooperative activities enable U.S. partners to be less vulnerable to coercion and ballistic missile attack. In addition, our strong partnership with Japan enabled a technical capability declaration of the second AN/TPY–2 radar now located at the Japan Air Self-Defense Force (JASDF) base in Kyogamisaki, Japan with other strategic partners in the region.

In addition to implementing our EPAA commitments to our NATO Allies, we continue to work with NATO to ensure U.S. C2BMC and NATO command and control networks are fully interoperable. We have successfully demonstrated interoperability between NATO and the U.S. command and control networks. MDA will continue to engage our NATO Allies to address international cooperation in missile defense.

CYBERSECURITY/ SUPPLY CHAIN RISK MANAGEMENT

We are very cognizant of the growing cyber threat and aggressively working to ensure the Nation's missile defenses will be able to operate in a highly contested cyber environment. Potential adversaries are developing cyber forces as part of their military structure and integrating them into their overall strategy. We are working with the Armed Services, the Combatant Commands, especially Strategic Command's USCYBERCOM, and other agencies in DOD and the Federal Government to counter this growing threat.

We are improving the cyber hygiene of our missile defense capabilities by ensuring our cybersecurity infrastructure has the latest security upgrades. We are assessing our systems, suppliers, and acquisition processes and ensure our critical software and hardware are strongly configured and trusted to lessen the risk of malicious activities. We have a rigorous cyber and Supply Chain Risk Management inspection program to examine everything about our systems from the trusted supply chain to the fielded capability. This helps us ensure the highest possible compliance levels. In May 2014, DISA Field Security Operations conducted a USCYBERCOMMissile Defense Integration and Operations Center in Colorado. MDA received an "Excellent" score. In June 2014 the MDA Computer Emergency Response Team (CERT) was inspected as a Tier 2 Computer Network Defense Service Provider by USCYBERCOM/DISA Field Security Operations. The MDA CERT received a "Commendable" rating (second highest rating possible) and was awarded another three year Authorization to Operate. Over the last year we conducted four Enterprise Cyber Range Environment experiments with independent, DOT&E red team penetration testing on the Joint Information Operations Range. The purpose of these experiments is to better understand the cyber robustness of BMDS capabilities to insider threats. MDA also has one scheduled for May 2015. MDA completed

62 cybersecurity inspections worldwide to ensure DOD and MDA compliance. We follow up on these inspections to ensure remediation of any identified cyber risks.

We must build resilient cyber defenses that are capable of detecting and mitigating threats without impeding operations in order to "fight through" the cyber threat. MDA collaborates with the Director of Operational Test and Evaluation to conduct cyber penetration testing on key missile defense capabilities. We then use the results of those tests to conduct risk assessments to prioritize cybersecurity improvements, develop mitigation strategies, and improve cyber training. We are also working to develop better cyber CONOPS to ensure every network defender in every location knows how to quickly react to cyber challenges.

We are working hard to incorporate cybersecurity requirements early into our acquisition lifecycle to ensure we are building cybersecurity into missile defenses, not the Defense Industrial Base to ensure they can protect any missile defense program sensitive information from getting into the hands of potential adversaries. We have seen too many instances where malicious cyber actors attempt to exfiltrate information from them, especially from their unclassified, commercial networks that have exposure to the internet. We will continue to work with Industry and the FBI to identify these issues and raise the costs of this type of behavior to those responsible in coordination with National authorities and in accordance with policy.

CONCLUSION

This budget balances investment in homeland and regional missile defense capabilities while pursuing advanced technology to pace the emerging threat. We will do this by improving current system capabilities and investing in the most promising technology to reverse the adversary's numerical advantage. MDA continues to aggressively pursue cost reduction measures through competition, partnering, and cooperation. MDA is on track with the Department's schedule for financial improvement and audit readiness, ensuring full accountability of resources and processes.

Mr. Chairman, we have several critical developmental and operational flight tests coming up this year and next. We will adhere to our "fly before you buy" approach, testing elements of the system to demonstrate they work before we commit to their fielding in order to ensure the warfighter will have cost-effective and reliable weapon systems. With the successful GMD intercept this past June, continued emphasis on GMD reliability and commitment to increase GBI inventory, planned RKV investments, and renewed focus on improved tracking and discrimination, I believe we are turning the corner with our homeland defenses. We remain on track with our EPAA deployments and continue to make good progress with our international partners across the globe. am also committed to investing in advanced technologies to defeat the threat of the future and to looking for new and innovative ways to deliver missile defense capability to protect our nation, our forward deployed forces and our friends and allies at lower cost to the government and the taxpayers.

I look forward to answering the committee's questions. Thank you.

Chairman SESSIONS. Thank you.

General Mann?

STATEMENT OF LIEUTENANT GENERAL DAVID L. MANN, USA, COMMANDING GENERAL, U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND/ARMY FORCES STRATEGIC COMMAND AND JOINT FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE DEFENSE

General MANN. Chairman Sessions, Ranking Member Donnelly, Senator King, Senator Fischer, and also your staff, thank you for your continued support of the soldiers and civilians and our families.

This is my third appearance before the subcommittee. It is, indeed, an honor to testify before you today to discuss the importance of missile defense to our Nation and the need to maintain these capabilities in the face of a maturing threat and declining budgets.

Today, I want to briefly summarize the missions of the organizations that I represent.

First, the Space and Missile Defense Command Army Forces Strategic Command that serves as a force provider to our combat-

ant commands. Three core tasks for this organization: first, to provide trained and ready global missile defenders today; to build future capabilities and structure for tomorrow; and then also to evaluate critical technologies to address future threats.

I also represent the Joint Functional Component Command for Integrated Missile Defense, which supports STRATCOM in integrating and synchronizing our global missile defense operations. As many of you know, for example, today, we have over 300 full-time National Guardsmen located in Fort Greely, Alaska, and Vandenberg Air Force Base, California, who operate the ground-based missile defense system. It represents the Nation's only ground-based defense against limited intercontinental ballistic missile attack. The soldiers are very good at what they do, and they take their mission very seriously.

In addition, JFCC IMD executes five key tasks. Number one, we synchronize operational level planning. We support ongoing operations. We integrate training exercises and test activities globally. We provide recommendations on the allocation of missile defense assets. Finally, we advocate for future capabilities.

Today, the missile defense threat continues to grow both in terms of numbers and sophistication. We as a Nation cannot afford a decrease in our readiness or capabilities. That said, we are extremely concerned about sequestration's impact on our readiness, and our ability to evaluate and test new technologies in order to stay ahead of the threat.

This committee's continued support of missile defense operations, and the men and women who develop and deploy our systems, is essential.

Again, I appreciate the opportunity to discuss our Nation's missile defense capabilities, and I look forward to addressing any questions you may have. Thank you.

[The prepared statement of General Mann follows:]

PREPARED STATEMENT BY LIEUTENANT GENERAL DAVID L. MANN, USA

Chairman Sessions, Ranking Member Donnelly, and distinguished Members of the Subcommittee, thank you for your continued support of our Service Members, Civilians, and Families. In the same capacity as my previous appearances before this subcommittee, I appear before you today bringing both a Joint and Army perspective on effective missile defense capabilities. Let me again express my appreciation to this Subcommittee for its continued support of the Army, the U.S. Strategic Command, the Department of Defense, and the missile defense community. I am honored to testify before this Subcommittee along with these distinguished witnesses who provide missile defense capabilities to our Nation, forward deployed forces, partners, and allies.

As outlined during an appearance before this subcommittee last year, my responsibilities encompass three main areas. First, as the Commander of the U.S. Army Space and Missile Defense Command (USASMDC), I have Title 10 responsibilities to train, maintain, and equip space and global ballistic missile defense forces for the Army. Second, as the Commander, Army Forces Strategic Command (ARSTRAT), I am the Army Service Component Commander (ASCC) to the U.S. Strategic Command (USSTRATCOM). I am responsible for planning, integrating, and coordinating all Army space and missile defense forces and capabilities in support of USSTRATCOM missions. Third, as the Commander of USSTRATCOM's Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), I am responsible for synchronizing missile defense planning, supporting ballistic missile defense operations, and advocating for missile defense capabilities on behalf of the Combatant Commanders.

In addition to the these three roles, the Chief of Staff of the Army recently designated USASMDC as the Army's Air and Missile Defense Enterprise Integrator

with responsibility to synchronize the Army's air and missile defense (AMD) strategy in coordination with other organizations involved in providing this critical capability. My task is to ensure the implementation of a holistic Army AMD strategy that includes force planning requirements, coordinated combat and materiel development, AMD acquisition and life cycle management, and strategic communications.

In accordance with these responsibilities, my intent today is to highlight the greatest missile defense asset—our great people; to briefly outline the strategic environment; to emphasize USASMDC/ARSTRAT's missile defense force provider responsibilities with respect to the Army and the Geographic Combatant Commanders (GCCs); to outline JFCC IMD's role as an operational integrator of Joint missile defense for USSTRATCOM; and finally to summarize a few of the key Army ballistic missile defense activities and developments in the context of a comprehensive approach to addressing an evolving ballistic missile threat.

THE WORKFORCE—RECOGNIZING AND PROTECTING OUR GREATEST ASSET

The challenges that we face cannot be mitigated without the dedication of our greatest asset—our people. Just as I mentioned last year, I feel it important to highlight our workforce, my concern of sequestration on our workforce, and the Army's continued commitment to deter instances of sexual harassment and assault. At USASMDC/ARSTRAT and JFCC IMD, our people remain our most enduring strength. The Service Members, Civilians, and Contractors support the Army and Joint Warfighter each and every day, both those stationed in the homeland and those globally deployed. We remain committed to providing trained and ready Service Members and Civilians to operate and pursue enhanced capabilities for the Nation's ballistic missile defense system (BMDS).

As recently highlighted during Congressional testimony by the Service Chiefs, the potential return of sequestration causes great concern—especially with regards to its impact on the workforce and our overall readiness. Within my commands, sequestration will negatively impact the space and missile defense enablers our Soldiers and Civilians provide to the Combatant Commanders. Specifically, readiness, training, and enhancements to space and missile defense capabilities will be degraded. Also, the return of sequestration will negatively impact the morale of our workforce. I believe that a more prudent course of action should be identified and implemented to ensure that we can continue to meet our current global responsibilities and those of tomorrow.

Sexual harassment and assault violate the Army's core values and harm the Soldiers, Civilians, and Family Members that make up our Army—it must be eliminated. In accordance with the Chief of Staff of the Army's guidance and direction, my leadership team fully embraces the importance and fundamental necessity of an effective Sexual Harassment/Assault Response and Prevention (SHARP) Program. The SHARP program effort has made noticeable strides in preventing assault and encouraging reporting of sexual harassment incidents. In line with Army requirements, our program provides Soldiers, Civilians, and Family Members with a SHARP program manager, sexual assault response coordinators, and victim advocates who are available 24/7/365 in order to safeguard our personnel and maintain their trust. I require my leadership to comprehensively investigate and report each claim of sexual harassment or assault. I demand nothing less than upmost prevention, accountability, and advocacy of our personnel—they deserve nothing less.

THE ADVANCING THREAT

Ballistic missile threats of our adversaries continue to grow, both quantitatively and qualitatively. Today, nine nations possess, or are suspected of possessing, nuclear weapons and 22 have ballistic missile capabilities that could carry nuclear weapons. Additionally, approximately 75 countries are developing unmanned aerial systems and several of these countries are exploiting land, sea, and air attack cruise missile capabilities. In the future, we expect to encounter more complex threats, to include advanced electronic and cyber intrusions, multiple simultaneous attacks, and even directed energy or supersonic capabilities.

To meet the objectives of the current Quadrennial Defense Strategic Guidance, USSTRATCOM and the Army continue to provide and enhance homeland and regional missile defense. In accordance with the Department's strategy to rebalance to the Asia-Pacific region, we have worked with partners in U.S. Pacific Command (USPACOM), U.S. Northern Command (USNORTHCOM), and USSTRATCOM to review and improve our capabilities in the USPACOM area of responsibility. In addition to the deployment of a Terminal High Altitude Area Defense (THAAD) battery in Guam that enhanced our ability to protect U.S. interests in the region, we

have deployed an additional forward-based sensor in Japan to bolster our defense capabilities.

The emplacement of 14 additional Ground-Based Interceptors at Fort Greely, Alaska, scheduled for completion in 2017, and an operational second missile defense sensor in Japan will provide improved capability and capacity to defend the Nation against a limited intercontinental ballistic missile (ICBM) attack. Toward this end, we continue to work with regional partners and allies to increase our information and data sharing and develop a global AMD force posture that leverages ever growing partner nations' capabilities. This will result in reduced strain on our force and enable more timely modernization of our AMD assets.

The Quadrennial Defense Review also establishes a priority to maintain a strong commitment to security and stability in Europe and the Middle East. We are continuing to maintain capability and capacity in these regions consistent with our regional security goals. In conjunction with our allies and partners, the DOD has deployed Patriot air and missile defense forces to Turkey and Jordan in order to enhance our current AMD posture while sending a strategic deterrence message to potential adversaries. It should be noted that these deployments add to the stress of an already highly deployed Patriot force. Without significant reduction in our worldwide deployments, it will be challenging for the Army to execute critical planned modernization of our AMD force over the next 5 years.

In summary, enemy air and missile threats continue to develop in complexity, quantity and capacity. The evolution of multiple sophisticated capabilities requires a holistic approach that effectively integrates offensive and defensive, kinetic and non-kinetic, and alternative capabilities to defeat air and missile threats. The growing complexity of the strategic environment based on technological advances of the threat and fiscal realities requires cost efficient and effective methods of integrating current and future capabilities. We continue to prioritize integrated missile defense resources to optimize all our capabilities in support of the Warfighter, particularly in light of the expense associated with traditional approaches. We continue to partner with the Missile Defense Agency (MDA), Combatant Commands, and Services to ensure we pursue a fiscally responsible path to keep pace with evolving threats by identifying and prioritizing additional capabilities that provide the greatest operational value.

PROVIDING AND ENHANCING MISSILE DEFENSE CAPABILITIES

USASMDC/ARSTRAT, a force provider of missile defense capabilities, is a split-based command with dispersed locations that are manned by multi-component Soldiers, Civilians, and Contractors. Commands around the world, including USSTRATCOM, USNORTHCOM, and the GCCs, leverage our capabilities. Our Title 10 responsibilities include operations, planning, integration, control, and coordination of Army forces and capabilities in support of USSTRATCOM's missile defense mission. USASMDC/ARSTRAT also serves as the Army's global operational integrator for missile defense, the Army's proponent for global missile defense force modernization, and the Army's technical center lead to conduct air and missile defense related research and development in support of Army Title 10 responsibilities.

Our operational function is to provide trained and ready missile defense forces and capabilities to the GCCs and the Warfighter—in other words, to address the requirements of today. For example, USASMDC/ARSTRAT Soldiers serving in the homeland and in remote and austere forward deployed locations operate the Ground-based Midcourse Defense (GMD) system and the Army-Navy/Transportable Radar Surveillance Forward-Based Mode (AN/TPY–2 FBM) radars. Highlights of the ongoing missile defense capabilities provided by our missile defense professionals include:

Support to Global Ballistic Missile Defense (BMD): Soldiers from the 100th Missile Defense Brigade, headquartered in Colorado Springs, Colorado, and the 49th Missile Defense Battalion, headquartered at Fort Greely, Alaska, remain ready, 24/7/365, to defend our Nation and its territories from a limited intercontinental ballistic missile attack. Under the operational control of USNORTHCOM, Army National Guard and active component Soldiers operate the Ground-based Midcourse Defense Fire Control Systems located at the Fire Direction Center in Alaska, the Missile Defense Element in Colorado, and the GMD Command Launch Element at Vandenberg Air Force Base, California. These Soldiers, in conjunction with USNORTHCOM, also oversee the maintenance of GMD interceptors and ground system components. At the Missile Defense Complex at the Fort Greely site, 49th Missile Defense Battalion military police secure the interceptors and communications capabilities at the Missile Defense Complex from physical threats. This brigade will also soon be responsible for security at the Fort Drum, New York, In-Flight Interceptor Communication

System Data Terminal. The GMD system remains our Nation's only defense against an ICBM attack.

GMD System Test and Development: In addition, Soldiers from the 100th Missile Defense Brigade actively participate in GMD test activities and continue to work with MDA developers on future improvements to the GMD system.

Support to Regional Capabilities: The 100th Missile Defense Brigade also provides GCCs with trained and certified AN/TPY–2 FBM radar detachments. These operational capabilities are present today at strategic locations around the globe.

Ballistic Missile Early Warning: In support of the Joint Force Commander's theater force protection, USASMDC/ARSTRAT continues to provide ballistic missile early warning within various theaters of operations. The 1st Space Brigade's Joint Tactical Ground Station (JTAGS) Detachments, under the tactical control of USSTRATCOM's Joint Functional Component Command for Space, but operated by USASMDC/ARSTRAT space-professional Soldiers, monitor launch activity and other infrared events. They provide essential information to members of the air, missile defense, and operational communities. Our JTAGS Detachments are forward deployed around the globe, providing 24/7/365, dedicated, assured missile warning to USSTRATCOM and GCCs in support of deployed and forward-based forces.

Our second major task is to build and mature future missile defense forces—our capability development function. These are the missile defense capabilities we will provide tomorrow. A major component of our capability development function is to provide relevant and updated training on our global missile defense systems. During the past year, USASMDC/ARSTRAT trained over 350 Soldiers and was recertified as an Army Learning Institution of Excellence for missile defense training.

The Army uses established and emerging processes to document its missile defense needs and pursue Joint and Army validation of its requirements. As a recognized Army Center for Analysis, USASMDC/ARSTRAT conducts studies to determine how to best meet the Army's assigned missile defense responsibilities. With these insights, we develop the Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) domains to address evolving threats and potential vulnerabilities to the GMD and AN/TPY–2 FBM missile defense systems. This disciplined approach helps to ensure limited resources are applied where Warfighter operational utility can be most effectively served.

In our third major missile defense task, USASMDC/ARSTRAT provides critical technologies to address future needs that will enhance Warfighter effectiveness—our materiel development function. In USASMDC/ARSTRAT, our technology development function is primarily focused on the space and high altitude domains. However, while MDA is the principal materiel developer for ballistic missile defense capabilities, USASMDC/ARSTRAT has a number of supporting missile defense related materiel development efforts, to include supporting research and development of an OSD-sponsored conventional prompt global strike capability to address ballistic missile threats. Following is a brief summary of two of our research and development efforts, as well as an overview of the capabilities of an essential Army testing range.

High Energy Laser Mobile Demonstrator: The technology objective of the High Energy Laser Mobile Demonstrator (HEL MD) is to demonstrate a solid-state laser weapon system to complement kinetic energy capabilities in countering rockets, artillery, and mortar (RAM) projectiles. This directed energy weapon system will also have a significant capability against unmanned aerial vehicles (UAVs). Considerable technology developments were realized over the past year for the HEL MD. Successful demonstrations were conducted for a pathfinder 10 kilowatt-class laser at White Sands Missile Range, New Mexico, and Eglin Air Force Base, Florida. These demonstrations served as a risk reduction for future subsystem development and integration while advancing this technology effort to a 50 kilowatt demonstration in 2017. The 50 kilowatt HEL MD will consist of a ruggedized and supportable high energy laser installed on a tactical military vehicle to enhance the safety of deployed forces. Another major component of the HEL MD is the beam director which will provide full sky coverage and engage below-the-horizon targets. As technology matures, higher power lasers will integrate with improved pointing and tracking capabilities to extend range and increase system effectiveness. The continued positive technology advances and testing results were recognized by the Army's senior leadership as HEL MD was recently selected by the Army Science and Technology Working Group as one of only three Army Capability Enabler programs to be further evaluated. The synergy of both directed and kinetic energy systems has the potential to significantly enhance both regional and homeland defense capabilities, particularly against cruise missile and indirect fire threats.

Low-Cost Target Development: The Army continues to pursue a technology effort to develop a suite of low-cost targets for the Patriot testing program. The intent is to design threat-representative targets at a substantially reduced cost for short-

range ballistic missile testing. Over the past year, we completed preliminary designs for three new short range ballistic missile targets based on existing excess solid rocket motors. The Army will realize significant savings conducting operational test events using these new targets beginning in Fiscal Year 2017. In addition, the Missile Defense Agency will use our targets in its test program later this year. We will continue to leverage existing missile inventory and technology advancements to develop less expensive targets that are representative of real world threats.

Missile Defense Testing: USASMDC/ARSTRAT operates the Ronald Reagan Ballistic Missile Test Site (RTS). RTS, located on the U.S. Army Garrison—Kwajalein Atoll in the Republic of the Marshall Islands, is critical to both offensive and defensive missile testing requirements, such as the GMD system and the U.S. Air Force strategic ballistic missile systems. In addition to their testing mission, personnel at the Reagan Test Site conduct continuous deep space surveillance and object identification missions. Just this past month, the U.S. Air Force began construction of their most advanced surveillance system—the Space Fence. In a few years, this improved surveillance capability will enable proactive space situational awareness while complementing existing systems at Reagan Test Site.

JOINT FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE DEFENSE—SYNCHRONIZING GLOBAL MISSILE DEFENSE PLANNING, FORCE MANAGEMENT, AND OPERATIONS SUPPORT

The Joint Functional Component Command for Integrated Missile Defense, or JFCC IMD, is USSTRATCOM's missile defense integrating element. This past January, we held a ceremony to honor the 10 year anniversary of the JFCC IMD. Like the other Joint Functional Component Commands, JFCC IMD was formed to operationalize USSTRATCOM missions and allow the headquarters to focus on integration and advocacy. Headquartered at Schriever Air Force Base in Colorado Springs, Colorado, the JFCC IMD is manned by professional Army, Navy, Air Force, Marine Corps, Civilian, and Contractor personnel.

As the Secretary of Defense and various Combatant Commanders have previously testified, the Warfighter remains confident in our ability to protect the Nation against a limited intercontinental ballistic missile attack, even in the face of the changing fiscal environment. Over the past year, we have deployed a new forward-based sensor in Japan to bolster regional and homeland defense capability and, following the June 2014 successful ground-based interceptor (GBI) test, we are in the process of integrating enhanced interceptors at Fort Greely. Additionally, MDA is on schedule to complete construction of the new Aegis Ashore site in Romania to meet our commitment to our allies in Phase 2 of the European Phased Adaptive Approach (PAA) and we continue to collaborate with MDA to initiate the procurement of the Long Range Discrimination Radar (LRDR) and the redesign of the GBI kill vehicle. These developments and deployment efforts are in line with warfighter priorities, which consist of sensor improvements, improved GBI reliability and performance, and increased regional capability and capacity.

On behalf of USSTRATCOM, JFCC IMD is working across our DOD enterprise to improve the integration of existing capabilities in order to maximize our efficiency and effectiveness to protect the homeland, deployed forces, partners, and allies. The key force multiplier is "integration," which is a critically important mission area for JFCC IMD and directly supports USSTRATCOM's assigned Unified Command Plan (UCP) responsibilities for missile defense.

As an operational and functional component command of USSTRATCOM, JFCC IMD has derived five key mission tasks from the USSTRATCOM UCP responsibilities:

- Synchronize operational missile defense planning, security cooperation activities, and the global force management process for missile defense capabilities.
- Conduct global ballistic missile defense operations support, above element joint ballistic missile defense training, asset management, and alternative execution support.
- Integrate, synchronize, and conduct training, exercises, and test activities. As the Warfighter interface, lead the planning and development of operational input for execution of the Integrated Master Test Plan (IMTP).
- Advocate and coordinate for global missile defense capabilities, conduct analysis and assessments of current and future capabilities, and recommend operational acceptance.
- Protect information systems and provide network support for ballistic missile defense operations.

To accomplish each of these five tasks, we maintain close collaborative relationships with the GCCs, MDA, the Services, the Office of the Secretary of Defense (OSD), the Joint Staff, and our allies. Through collaborative processes, we continually enhance our deployed capabilities while gaining operational experience and confidence in our collective ability to defend the Nation, deployed forces, partners, and allies. Furthermore, I will highlight some of our collaborative efforts to enhance missile defense planning and capabilities for both the homeland and regional architectures.

Expansion and Integration of the Missile Defense Architecture: In response to the evolving strategic environment, we continue to bolster homeland and regional missile defense capabilities. In addition to the deployed AN/TPY–2 FBM radars and deployment of the THAAD battery to Guam, we are expanding our missile defense collaboration with allies. We continue to mature the European PAA with the forward deployment of Aegis BMD ships in Rota, Spain, developing the Aegis Ashore site in Romania, and continuing the production of the SM–3 IB interceptors used for ballistic missile defense. Given many of the challenges associated with implementation of these architectures, JFCC IMD, supporting USSTRATCOM as the global synchronizer for missile defense, is collaborating with the GCCs to assess and address the cross-regional gaps in the areas of planning, policy, capabilities, and operations.

Global Planning and Assessment: Regional and global missile threats continue to increase in numbers and complexity. This year, JFCC IMD led the missile defense community in the development of the Global Missile Defense Concept of Operations which better articulates systemic risk with the likely simultaneous execution of GCC operational plans across multiple areas of operations. This fundamentally changes the way the missile defense enterprise analyzes and assesses the operational environment. The output of this analysis directly informs the Global Integrated Air and Missile Defense Assessment (GIAMDA). The GIAMDA serves to shape recommendations for global force management and advocacy efforts for future capability investments. We have completed the 2014 GIAMDA and are currently conducting the 2015 assessment. For the 2014 assessment, we continued to expand the assessment to look at integrating cyber, electronic warfare, and global strike in order to provide a more holistic set of military capabilities to counter an evolving adversary threat.

Global Force Management: The increasing demand of BMD assets is managed by the Joint Staff and the Services. USSTRATCOM, as the designated Joint Functional Manager for missile defense, relies upon JFCC IMD to evaluate and recommend sourcing of BMD requirements based on assessed risk. Due to the high demand, low-density nature of missile defense assets, all sourcing decisions have a direct and significant impact to other Combatant Commanders' campaign and contingency plans. The Global Force Management process enables senior leaders to make more informed BMD sourcing decisions based on global risk.

Multi-Regional BMD Asset Management: JFCC IMD, in coordination with USSTRATCOM and the GCCs, manages the availability of missile defense assets to balance operational readiness postures, scheduled and unscheduled maintenance activities, and the MDA and Services' test requirements. This important process allows us to continually assess our readiness to defend against a ballistic missile attack and to recommend adjustments to optimize the overall BMD architecture.

Allied Ballistic Missile Defense Integration: JFCC IMD continues to focus on the integration of allies into regional missile defense architectures, enhanced security cooperation between missile defense capable nations, and shared regional deterrence and defense responsibilities across partner nations. One tool employed to promote cooperation is the Nimble Titan campaign, a biennial series of multi-national missile defense experiments designed to explore policy and operational concepts required for coalition missile defense. The Nimble Titan campaign provides a unique venue to advance U.S. missile defense policies and combatant command regional security objectives. The Nimble Titan community of interest consists of 23 nations and 2 international organizations. The campaign goals for Nimble Titan are four fold:

- Examine national and multinational BMD decision making processes and their effects on planning, design, and execution.
- Explore the effects of policy guidance on defense design.
- Develop a common understanding of integrated air and missile defense.
- Examine and identify opportunities to support planning and execution of integrated air and missile defense operations.

In April 2014, we concluded our fourth biennial series—Nimble Titan 14. Nimble Titan 14 included Ministry of Foreign Affairs and Ministry of Defense representatives from 21 nations and 2 international organizations, along with Department of State, OSD, Joint Staff, MDA, and combatant command representatives. In addi-

tion, 40 senior leaders from the United States and 13 other nations participated in a concurrent senior leader program. For the first time, Nimble Titan 14 included participants from the Middle East and non-NATO aligned European nations. Through Nimble Titan, we continue to focus on cross-regional coordination, sensor integration, and multinational MD planning solutions.

Nimble Titan is critical to developing a common understanding of policy hurdles associated with combined missile defense architectures and to influence future U.S., ally, and partner missile defense policy development and cooperation. Additionally, this exercise provides participating nations with critical experience in information-sharing as well as command and control procedures that enhance synchronized missile defense capabilities. Conclusions derived from this exercise continue to inform policy decisions and multinational BMD planning. Planning has already begun for the next iteration of this war game—Nimble Titan 16.

Joint BMD Training: DOD designated USSTRATCOM as the lead for integrating and synchronizing Joint BMD training. In coordination with USSTRATCOM, the Joint Staff, Combatant Commands, and the Services, we have developed a comprehensive and innovative training program to close gaps between Service, Joint, and regional BMD training and education. New and updated courseware has been developed and fielded to enhance combatant command and warfighter training needs. Blended learning courseware and a Joint BMD Training Community of Practice are under development to improve efficiency in delivery and reduce costs. Over the past year, JFCC IMD provided 140 courses to over 2,300 students around the world via the Joint BMD Training and Education Center. Additionally, in keeping with Joint Vision 2020, JFCC IMD provided several training courses to ally and partner nations.

Warfighter Acceptance and Integrated Master Test Plan: As the missile defense architectures mature, Warfighters require a credible, comprehensive assessment of new capabilities to inform operational acceptance. In 2014, we tested our new AN/TPY–2 FBM in Japan, conducted a successful intercept flight test of the GMD system, and flight tested a triple engagement of both cruise and ballistic missiles with our Aegis BMD system. The focus of this year's operational tests is to demonstrate the integrated capability of Phase 2 of the European PAA architecture, which will include Aegis BMD ships and Aegis Ashore. Additionally, JFCC IMD continues to work closely with the MDA, the Office of the Director, Operational Test and Evaluation, and USNORTHCOM to address issues future improvements of both the Capability Enhancement (CE)-I and CE–II variants.

In summary, JFCC IMD serves an integrating role for missile defense across multiple regions as we operationalize new capabilities, enhance command relationships, and reinforce our missile defense partnerships with allies. In view of worldwide events and current fiscal challenges, JFCC IMD remains focused on our key mission task to collaborate with the GCCs and MDA to meet current and future ballistic missile threats. While work remains to be done, we have made significant progress in evolving our global missile defense capabilities, thereby strengthening the defense of the homeland and advancing our partnerships with allies in this pressing endeavor.

ARMY CONTRIBUTIONS TO THE NATION'S MISSILE DEFENSE CAPABILITIES

The Army works closely with MDA and continually supports its materiel development efforts to develop and field systems that are integral to our Nation's air and missile defense capabilities. A summary of the Army's major air and missile defense programs follows.

Army Integrated Air and Missile Defense (IAMD): As we transition from an Army at war to one of deterrence, air and missile defense (AMD) units have become a key strategic enabler. AMD is an enduring Army core function and an essential component of the Army mission to provide wide area security. In addition to defense against ballistic missiles, the current AMD strategy seeks to develop a more comprehensive portfolio of IAMD capabilities to provide protection against cruise missiles, unmanned aerial systems, and long-range precision rocket, artillery, and mortar attacks.

The IAMD Battle Management Command System (IBCS) remains an Army priority effort and serves as the foundation for Army AMD modernization. Modernization is critical in our quest to stay ahead of the advancement of the threat. The program will field a common mission command system to all echelons of Army AMD forces in order to defend against cruise missiles, manned and unmanned aircraft, air-to-ground missiles, tactical ballistic missiles, and rocket, artillery, and mortar attacks. IBCS will provide a common and flexible AMD mission command network capable of coordinating air surveillance and fire control across Services and with coali-

tion partners. When fielded, IBCS will componentize the AMD force, breaking the current system-centric paradigm, which will facilitate open industry competition in support of the AMD community. Additional efforts are underway to integrate IBCS and Command and Control, Battle Management, and Communications (C2BMC) to support the BMD mission.

As the lead integrator for the AMD enterprise, one area of concern is the ever increasing operational demand and how this demand will impact planned modernization. Starting next fiscal year, the AMD enterprise will begin its most comprehensive modernization effort ever undertaken as IBCS is fielded to the AMD force. IBCS will interact with every AMD weapon component—shooters, sensors, and C2BMC. The AMD convergence between the existing demand and upcoming modernization effort will be a major undertaking for the AMD enterprise and the Army.

Patriot/Patriot Advanced Capability-3 (PAC–3): The Patriot air and missile defense system remains the cornerstone of our BMD forces deployed in support of GCCs. It remains the Army's premier weapon system against air and tactical ballistic missile threats. The Patriot system is now over 35 years old and, not surprisingly, the effort and costs associated with maintaining operational reliability rise steadily each year. Fortunately, several years ago, the Army embarked on a comprehensive modernization strategy that will completely replace Patriot's command and control hardware and upgrade the radar, launcher, and interceptor components through competitive development and procurement. The aim is to increase reliability, drive down operational and sustainment costs, and remain viable well into the future. Each facet of this strategy, development of IBCS, radar and launcher modernization and the Missile Segment Enhancement (MSE) are critical to our Nation's ability to provide our Combatant Commanders with more innovation and capabilities in the face of an ever evolving threat. With nearly half of all Patriot units currently deployed, operational tempo and stress remain high.

A number of significant Patriot/PAC–3 capability enhancements have been accomplished over the past year. Among the accomplishments were the completion of the Army's planned PAC–3 capability upgrades of all 15 Patriot battalions and continued successful operational flight tests of the next generation PAC–3 missile, the MSE. During recent successful testing, both tactical ballistic missiles and air breathing threats were simultaneously engaged. The Army remains on track for delivery of the MSE to the Warfighter by the fourth quarter of 2015. Additionally, the Patriot radar is receiving a new radar digital processor. Coupled with recent software upgrades, the new processor increases performance of the radar against evolving threats while dramatically improving reliability, availability, and maintainability. To make maximum use of the MSE missile and the radar upgrades, the Army is also preparing to test the next version of the Patriot software, Post Deployment Build-8. Successful testing and fielding of this software will advance the Patriot system into the next generation of hardware capability.

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS): Homeland air and missile defense is heavily reliant on early warning and over-the-horizon target acquisition in order to provide decision and battle space. In accordance with guidance from OSD and the Joint Staff, the Army has deployed the JLENS system to Aberdeen Proving Grounds, Maryland, for a three-year operational exercise. This exercise will demonstrate the capability to detect, track, and identify potential air threats to the greater Washington, D.C. area, and to integrate JLENS into the North American Aerospace Defense Command's (NORAD) air defense architecture. During the 3-year exercise window, JLENS capabilities will be fully explored in a real-world environment and evaluated for its operational utility in support of NORAD's homeland defense mission.

The JLENS system leverages proven aerostat technology to provide situational awareness and track airborne objects such as cruise missiles, manned and unmanned aircraft, and large caliber rockets. The JLENS consists of two unmanned aerostats with radar systems for surveillance and fire control. Each radar system employs a separate 74-meter tethered aerostat, a mobile mooring station, radar and communications payloads, a processing station, and associated ground support equipment.

Terminal High Altitude Area Defense System: THAAD, a key component of the BMDS architecture, is designed to defend deployed and allied forces, population centers, and critical infrastructure against short and medium-range ballistic missiles. THAAD is a high demand, low-density asset that is mobile and globally transportable. A fully operational THAAD battery consists of 95 Soldiers, an AN/TPY–2 radar, six launchers, a fire control and communications element, a battery support center, and a support element. THAAD has a unique intercept capability in both the endo- and exo-atmosphere using proven hit-to-kill technology. There are now four

activated THAAD batteries. Equipment training and fielding has been completed for three of the batteries. In April 2013, one of these batteries conducted the first-ever operational deployment of THAAD in response to the escalation of tensions in the Pacific region. The fourth THAAD battery is currently undergoing training and will be operationally available next year. A fifth battery is scheduled to become fully operational the following year. By 2019, the THAAD force is scheduled to consist of seven batteries. A new training facility, which enables virtual training for the Soldiers who will operate the THAAD system, recently opened at Fort Sill, Oklahoma. The addition of THAAD capabilities to the Army's air and missile defense portfolio brings an unprecedented level of protection against missile attacks to deployed U.S. forces, partners, and allies.

CONCLUSION

Mr. Chairman and Ranking Member Donnelly, as a member of the Joint missile defense community, the Army continues to pursue enhancements to the Nation's missile defense system. As a Service, the Army has lead responsibility for GMD, AN/TPY–2 FBM, Patriot, JLENS, and THAAD. Our trained and ready Soldiers operating GMD elements in Colorado, Alaska, and California remain on point to defend the homeland against a limited intercontinental ballistic missile attack. As a force provider to the GCCs, our Soldiers provide essential regional sensor capabilities and ballistic missile early warning. Our regional forces continue to leverage ally collaboration and planning efforts in developing integrated and interoperable defenses against the various threat sets. USSTRATCOM, through the JFCC IMD, continues to integrate BMDS capabilities to counter global ballistic missile threats and to protect our Nation, deployed forces, partners, and allies.

While the operational, doctrine, and materiel development enhancements of the BMDS are essential, our most essential assets are the Soldiers, Sailors, Airmen, Marines, Civilians, and Contractors who develop, deploy, and operate our missile defense system. I appreciate having the opportunity to address missile defense matters and look forward to addressing your questions.

Chairman SESSIONS. Thank you.

Mr. Gilmore?

STATEMENT OF HON. J. MICHAEL GILMORE, DIRECTOR OF OPERATIONAL TEST AND EVALUATION, DEPARTMENT OF DEFENSE

Mr. GILMORE. Mr. Chairman, members of the committee, I will briefly summarize the highlights of my written testimony.

Testing conducted during the past 5 years of the regional theater missile defense systems—that is Aegis, Terminal High Altitude Aerial Defense, and Patriot—have demonstrated their effectiveness under an expanding set of realistic operational conditions.

During that same period, testing of the Ground-Based Midcourse Defense system has revealed a number of important engineering shortfalls that needed correction, but the intercept failures caused by those shortfalls precluded demonstration of GMDs effectiveness under a broader set of realistic operational conditions.

However, if we execute the integrated master test plan that Admiral Syring has developed over the next several years, that will expand our knowledge and demonstration of the capabilities of GMD under a broader set of operational conditions, to include an upcoming test against an ICBM target, testing of salvos using salvos of interceptors, and testing of multiple simultaneous engagements, as well as testing in the presence of more realistic countermeasures.

As I mentioned, several Exo-Atmospheric Kill Vehicle fixes that were important were demonstrated during last year's developmental flight test, which successfully intercepted the target. That is definite progress.

Nonetheless, as Admiral Syring himself has pointed out, the reliability and availability of the operational ground-based interceptors are less than desired. That is why the Admiral is undertaking a reliability improvement program that is now funded. That is very important to improve the reliability and availability of the interceptors.

Although, in the long run, the solution there is the Redesigned Kill Vehicle based on a more rigorous systems engineering process.

The next flight test of the GMD system will take place later this year. It will be a nonintercept test of a Capability Enhancement-II kill vehicle, similar to the one that was just tested, to demonstrate the performance of alternate different thrusters, which again are supposed to help with some of the problems that have been demonstrated in past tests, and the end-to-end discrimination of a complex target scene including countermeasures.

In my view, a robust ability to discriminate is critical for an effective homeland defense. The planning and analysis being conducted for this test have already revealed significant issues that Admiral Syring is using to plan his future program.

In the fourth quarter of fiscal year 2016, MDA plans to conduct, as I mentioned just a moment ago, the first intercept of intercontinental ballistic missile. This is a critical flight test, as well as subsequent salvo tests and multiple simultaneous engagement tests, because those are going to be conducted under realistic conditions reflecting how the system would actually be used.

The CE–I interceptor is the oldest in the GMD inventory. Its last flight test in fiscal year 2013 was a failure, so I recommend that we retest as soon as possible a CE–I interceptor, CE–I equipped interceptor, incorporating changes in hardware and software that are being made to correct the problems that were revealed in the past flight test.

Aegis Ballistic Missile Defense with Standard Missile-3 Block IB completed initial operational testing and evaluation in early fiscal year 2014. Testing has demonstrated Aegis is capable of defeating short-range and simple separating medium-range ballistic missile threats and shorter range intermediate-range threats, and its effectiveness depends upon the specifics of the threat and the circumstances of deployment.

However, there have been third stage rocket motor failures common to the SM–3 IA and IB, and MDA has determined that a redesign of that Third-Stage Rocket Motor nozzle is needed to increase the missile's reliability. In my view, the new design will have to be flight tested, not just ground tested, a number of times before we can have confidence that those fixes and improved reliability is as desired.

Later this year, we are going to do Flight Test Operational-02, the second operational flight test at a system level, of BMDS elements. That will be important. There are two events that are planned, one involving Aegis Ashore, the testing facility at the Pacific Missile Range Facility, as well as testing using Aegis ships in a second event. Both of those events will provide information that is critical to my evaluation of the effectiveness of European Phased Adaptive Approach Phase 2, which the Nation wants to declare operational by the end of the year.

In the fiscal year 2015 appropriations bill, Congress reduced MDA's funding for testing and flight test targets. In response, MDA, consistent with its priorities, eliminated one particular Aegis BMD flight test. I would, certainly, urge that MDA work with the Congress, if at all possible, to restore that flight test because it is against a critical ballistic missile threat. I would be happy to elaborate on the details in the appropriate setting.

THAAD, Terminal High Altitude Area Defense, has demonstrated effectiveness against short- and medium-range targets. As part of FTO–02 later this year, it will hopefully demonstrate effectiveness against complex separating short-range ballistic missiles and prove the effectiveness of its advanced discrimination algorithms. So that test will provide important information not just about Aegis, but also about THAAD.

In my written testimony, I discuss concerns with Patriot reliability and training. I certainly recommend the Services and MDA work to address those concerns.

Finally, flight testing and modeling and simulation of the regional theater BMDS systems—that is Patriot, THAAD, and Aegis—are sufficient to support a quantitative assessment of the systems performance against short- and medium-range ballistic missile threats.

I provide those estimates, they are classified, in the classified section of the annual report I just submitted to Congress.

However, flight testing and modeling and simulation are not yet sufficient. In my judgment, based on current program plans and the pace of testing, they will not be until the beginning of the next decade to enable me to provide a rigorous quantitative assessment of GMD effectiveness.

Thank you.

[The prepared statement of Mr. Gilmore follows:]

PREPARED STATEMENT BY J. MICHAEL GILMORE

Chairman Sessions, Ranking Member Donnelly, and distinguished Members of the Committee, thank you for the opportunity to discuss missile defense testing and my assessment of the Ballistic Missile Defense System (BMDS) and the elements that comprise it.

Testing conducted during the past five years of the Regional/Theater missile defense elements has demonstrated their effectiveness under an expanding set of realistic operational conditions. Testing conducted during that period of the Ground-Based Midcourse Defense (GMD) element has revealed a number of important engineering shortfalls that needed correction, but the intercept failures caused by these problems precluded increased demonstration of GMD's effectiveness under a broader set of realistic operational conditions.

GMD ASSESSMENT

The Missile Defense Agency (MDA) has demonstrated GMD's capability to defend the United States against small numbers of simple ballistic missile threats launched from North Korea and Iran. Several Exo-atmospheric Kill Vehicle fixes were demonstrated during last year's developmental flight test (FTG–06b), which successfully intercepted the target. However, the reliability and availability of the operational Ground-based Interceptors are less than desired and need to be substantially improved; MDA is taking steps that, over time, should yield improvement.

The next flight test of the GMD system will take place later this year. Ground-based Midcourse Controlled Test Vehicle-02+ (GM CTV–02+) is a non-intercept test of a Capability Enhancement-II (CE–II) kill vehicle that will demonstrate the performance of alternate divert thrusters in a flight environment and the end-to-end discrimination of a complex target scene including countermeasures through the

GMD fire control loop. Data collected from this test will be used to evaluate discrimination techniques which can help distinguish a real warhead from a decoy. A robust ability to discriminate is critical for an effective homeland defense and the planning and analysis being conducted for this test have already revealed issues regarding GMD's discrimination capabilities. The MDA is using this information to determine the content of the Agency's future research and development efforts. In the fourth quarter of fiscal year 2016, the MDA plans to conduct Flight Test GMD–15 (FTG–15), which will be the first intercept flight test for the CE–II Block 1 Ground-Based Interceptor and the first intercept attempt of an intercontinental ballistic missile-range target. This is also a critical flight test.

The CE–I interceptor is the oldest in the GMD inventory, and its last flight test in fiscal year 2013 was a failure. Numerous CE–I interceptors remain deployed as part of the GMD system. Consistent with the high priority of the Homeland Defense mission, I recommend the MDA retest as soon as feasible the CE–I interceptor incorporating changes in its hardware and software made to correct the problems that caused the flight test failure to demonstrate the problems have actually been fixed.

As documented in MDA's Integrated Master Test Plan (IMTP), GMD flight testing is proceeding at a pace of one test per year. For these expensive flight tests to add value to the GMD program, enough time must be given to conduct analyses of the previous flight test data, to make system improvements based on the previous flight test results, and to plan for the next test. Substantial overlaps between analysis of data from a just-conducted test and planning for the next test would be counterproductive. The pace at which all these activities can be conducted depends on the quality, experience, and size of MDA's engineering staff and the capacity of the Agency's ground-test and analysis capabilities, not only on the number of interceptors available for flight testing or the number of targets available (target availability and readiness continue to be problematic). So, while it would be possible to increase the pace of GMD testing somewhat relative to the current (and historical) pace of about one test per year, doing so would require expanding MDA's staff of competent engineers and test infrastructure, both of which would require substantial resources and time to execute.

AEGIS BALLISTIC MISSILE DEFENSE (BMD) ASSESSMENT

The Aegis Ballistic Missile Defense (BMD) 4.0 system with Standard Missile-3 (SM–3) Block IB guided missiles completed Initial Operational Test and Evaluation in early fiscal year 2014. Testing has demonstrated that the Aegis BMD 4.0 system is capable of defeating short-range and simple-separating medium-range ballistic missiles and shorter-range intermediate-range threats in the midcourse phase of flight for many realistic operational scenarios. Analysis of data obtained during flight testing and the maintenance demonstration showed that the Aegis BMD 4.0 system is also suitable.

However, SM–3 Third-Stage Rocket Motor failures encountered during flight testing have affected the reliability of the SM–3 missile. The MDA has determined that a re-design of the Third-Stage Rocket Motor nozzle is needed to increase the missile's reliability. The MDA generated new design concepts and began the initial ground testing of the redesigned parts in fiscal year 2014. The new design will have to be flight tested (not just ground tested) multiple times before its reliability can be determined with confidence.

The MDA also demonstrated the capability of the Aegis Ashore test site at the Pacific Missile Range Facility to fire, establish uplink/downlink communication, provide guidance commands, and provide target information to an SM–3 Block IB guided missile. The Aegis Ashore Controlled Test Vehicle-01 test was the first SM–3 missile firing from Aegis Ashore. Flight Test Operational-02 (FTO–02), scheduled for fiscal year 2015, is a BMDS system-level operational test, consisting of two events. Event 1 will provide critical data needed for my assessment of Aegis Ashore's capability to defend Europe as part of the President's European Phased Adaptive Approach (EPAA). An AN/TPY–2 radar in forward-based mode will provide the target track data that will enable Aegis Ashore to conduct a launch-on-remote engagement. Space-based sensors and command, control, battle management, and communications systems will also participate. Event 1 will be the first intercept test of Aegis Ashore and it will be conducted against an intermediate-range ballistic missile target. Event 2, which will also provide data critical to my assessment of the EPAA's ability to integrate the defense provided by Aegis Ashore with the defense capabilities of Aegis ships, will use a U.S. European Command scenario to test the Aegis BMD capability to engage a medium-range ballistic missile in the presence of post-intercept debris while simultaneously conducting anti-air warfare operations against a cruise missile surrogate. To create the debris scene for Aegis BMD, THAAD will

engage a short-range ballistic missile with its advanced radar algorithms and new Lot 4 interceptor.

As a result of a successful critical design review conducted in 2013, the design of the new and larger SM–3 Block IIA guided missile is now complete and the program is proceeding to product development and testing. In October 2013, the MDA conducted a propulsion test vehicle test called PTV–1. It demonstrated that the SM–3 Block IIA missile can launch from the Aegis BMD vertical launch system.

In its fiscal year 2015 appropriations bill, Congress reduced MDA's funding for testing and flight test targets. The MDA addressed these funding cuts by eliminating the FTM–24 Aegis BMD flight test. In my view, this flight test is critical to determining the Aegis BMD system performance against a key ballistic missile threat. I urge MDA to work with the Congress to restore FTM–24 as soon as possible. I would be happy to elaborate further on this issue in the appropriate forum.

TERMINAL HIGH ALTITUDE AREA DEFENSE (THAAD) ASSESSMENT

The Terminal High Altitude Area Defense (THAAD) system has demonstrated effectiveness against short- and medium-range targets. In 9 flight tests, beginning with FTT–06 and including one multi-simultaneous engagement, conducted between fiscal year 2007 and fiscal year 2013, THAAD intercepted all 10 target ballistic missiles including 8 short-range and 2 medium-range ballistic missiles. One flight test in fiscal year 2009 demonstrated a salvo engagement and another flight test in fiscal year 2012 demonstrated a multiple simultaneous engagement. Further flight testing is planned to demonstrate the performance of the radar's advanced algorithms against more complex short- and medium-range ballistic missile targets and the system's capabilities against intermediate-range ballistic missile threats (which could be employed against Guam), with the latter test now scheduled to occur during the fourth quarter of fiscal year 2015.

Analyses of data from the Reliability Confidence Test and multiple flight tests suggest that THAAD system components are not exhibiting consistent or steadily increasing reliability growth between test events. The tools and diagnostic equipment available to Soldiers are insufficient to accurately emplace, maintain, and assess the operational status of THAAD equipment. THAAD has also demonstrated deficiencies during natural environment testing, which tests a system's ability to withstand expected temperature extremes, temperature shock, humidity, rain, ice, snow, sand, and dust. The deficiencies need to be addressed to ensure THAAD is capable of operating properly when and where it is needed.

A primary concern to me is the training being offered to THAAD Soldiers. The high demand for operational THAAD units overseas has reduced the time available for operator training, and I urge both MDA and the Army to work together to address this issue. For example, during recent tests, THAAD operators commented on the lack of opportunities to train with THAAD in an operationally realistic environment alongside other missile defense systems like Aegis BMD and Patriot. These systems are frequently expected to operate in conjunction with THAAD, and operators' ability to conduct proper coordination among all BMD systems is necessary for these missile defense systems to operate together effectively.

PATRIOT ASSESSMENT

Patriot is effective against many types of short-range tactical ballistic missiles, and has demonstrated capability against a medium-range missile target. Patriot successfully engaged tactical ballistic missiles in flight tests against more than 30 short-range ballistic missile targets since 1999 and in one flight test against a medium-range ballistic missile target in 2002. Sixteen flight tests since 2000 included multiple simultaneous Patriot engagements against two targets. In its most recent operational test conducted between May 2012 and January 2013, Patriot did not meet its operational requirements for reliability, maintainability, or availability.

The recent operational test highlighted the growing complexity of the Patriot system, which requires a higher level of operator expertise and more intensive training than that which the Army currently provides. As with THAAD, there is a high demand for operational Patriot units in the field. In response to this demand, the Army deactivated its dedicated Patriot test unit in fiscal year 2013. Soldiers from the Patriot Test Battalion provided valuable user insight during development testing and provided operationally representative Soldiers for operational testing. The Test Battalion helped ensure proper training materials were developed and tested. The deactivation of the Test Battalion will lengthen the duration of operational testing and delay the fielding decisions for the Patriot Missile Segment Enhancement and Post-Deployment Build-8 software. The loss of the Test Battalion has reduced the Army's ability to ensure Patriot unit Soldiers are trained to operate the system

safely and effectively in combat, when U.S. and coalition aircraft and other BMD systems will be sharing Patriot's battlespace. Also, Patriot's ability to operate (or not) in the presence of the proliferating and increasingly effective capabilities for electronic attack our potential adversaries are developing and fielding needs to be fully characterized through robust testing, and key shortfalls in performance revealed by that testing corrected without delay. I commend the Army for its recent efforts to begin that characterization testing.

COMMAND, CONTROL, BATTLE MANAGEMENT, AND COMMUNICATIONS (C2BMC) ASSESSMENT

Effective battle management is crucial for the success of the integrated BMDS, and Command, Control, Battle Management, and Communications (C2BMC) is the primary element intended to enable battle management at the system level. Battle management capability is needed to ensure effective engagement of threat missiles in a complex battlespace with multiple BMD systems, and to prevent interceptors being wasted by firing at enemy missiles which have already been engaged by other systems.

Spiral 6.4, operational since 2011, is the currently deployed version of C2BMC. Spiral 6.4 provides situational awareness for the BMDS, forwards track data between BMDS elements, and provides battle management and engagement monitoring. However, it does not have the capability to provide automated engagement direction among BMD elements.

With the addition of the Global Engagement Manager Suite, Spiral 6.4 added the capability to manage multiple AN/TPY–2 forward-based radars. Dual radar management by the Global Engagement Manager was demonstrated during distributed ground testing in the United States European Command in support of European Phased Adaptive Approach Phase 1. Spiral 6.4 has participated in flight tests FTM–15, FTG–06a, FTI–01, and FTO–01, in which it collectively demonstrated control of a single AN/TPY–2 radar and track forwarding capabilities. Spiral 6.4 also participated in FTG–07 and FTG–06b by forwarding Aegis Weapon System tracks to GMD.

TEST ADEQUACY

The MDA conducted eight flight tests and five ground tests during FY/CY14. Data from a ninth flight test conducted at the end of fiscal year 2013, the first system-level operational test, Flight Test, Operational-01 (FTO–01) were also analyzed during the year. The MDA conducted these tests in accordance with the DOT&E-approved IMTP. In fiscal year 2015, the MDA plans to conduct 12 flight tests, and in fiscal year 2016, 7 flight tests.

Flight testing of the Regional/Theater BMDS autonomous combat systems is sufficient to support a quantitative assessment of the systems' performance against short- and medium-range ballistic missile threats. However, flight testing is not adequate to provide quantitative assessments of effectiveness against intermediate-range ballistic missile threats. The classified sections of my annual report on BMD provide those quantitative estimates of effectiveness for the cases in which they are feasible.

Homeland Defense flight test data and modeling and simulation (discussed subsequently) are not yet sufficient, and likely will not be until the beginning of the next decade, to enable a rigorous quantitative assessment of GMD effectiveness.

As discussed above, MDA addressed a Congressionally-directed cut to the MDA test and targets programs in fiscal year 2015 by deleting FTM–24, a critical test of the SM–3 Block IB guided missile. This test should be restored and conducted as soon as feasible.

CYBERSECURITY

The United States faces a growing cyber threat, and our Nation's ballistic missile defenses need to be secure against that threat. Over the last year the MDA conducted four experiments on a cyber testing range using independent cyber red teams provided by my office. The purpose of these experiments was to better understand the cyber robustness of BMDS capabilities to insider threats, and to address any cybersecurity vulnerabilities that were found. The MDA plans to continue to use cyber ranges to improve its cybersecurity posture, and plans to conduct its next cyber range experiment in May 2015.

THAAD AND PATRIOT TRAINING

As I mentioned previously, there are deficiencies in the training provided to THAAD and Patriot Soldiers. THAAD is a complex automated system that is de-

signed to operate effectively with other BMD systems in the region where it is deployed. Training issues continue to surface during test events and as Soldiers rotate into and out of THAAD units. Some of these issues have been mitigated through the installation of a THAAD-specific training facility at the Ft. Sill Schoolhouse; by increasing the amount of training; and by developing training aids, devices, simulators, and simulation. However, the need to make additional improvements remains.

Current Army training for THAAD emphasizes training for individual Soldiers. Current THAAD training does not provide the Soldier with a crew, team, or Joint-based operationally realistic fighting experience as part of an integrated BMDS. Hence, currently THAAD soldiers are not "trained as they will fight."

Current institutional training devices do not implement the latest system software version and do not provide the Soldier with timely feedback. Training devices that do not accurately emulate the system and prepare the Soldier to operate and maintain the system to yield the best system performance can result in missed intercepts.

THAAD-specific training gaps and deficiencies continue to be discovered. Soldiers are assigned to a THAAD unit without THAAD-specific training support. This impedes the Soldier's ability to effectively and efficiently carry out the THAAD mission, resulting in a greater reliance on contract support.

An integrated, team-based, and Joint interoperability training environment is essential to ensuring THAAD effectiveness during a conflict. The Army, in coordination with the MDA, should modify its institutional training policy and move from an individual Military Occupational Specialties (MOS)-centric training approach to a systemic, integrated, team-based approach that includes Joint interoperability training.

To properly implement such an approach, the Army should ensure the availability of adequate funding, training aids, software and radar simulator capabilities, and evaluate whether changes to career progression, crew rotation, and professional development programs are required.

The Army should implement an objective and quantifiable Army training standard that reflects the level of expertise required for team and Joint operations, develop and fund a training plan with a sufficient number of training weeks to develop Soldier expertise, and consider the benefit of a THAAD-specific MOS.

Patriot training is currently provided to Patriot unit Soldiers and as a foundation for THAAD unit Soldiers. However, the level of Patriot training is insufficient, given the complexity of the Patriot system and the fact that in combat a Patriot unit may be called upon to operate in a congested battlespace with friendly and enemy aircraft, high numbers of threat missiles, and numerous other U.S. and coalition BMD assets. Since my fiscal year 2010 Annual Report to Congress, I have recommended that the Army improve Patriot training to equip Soldiers with the required level of expertise to ensure a Patriot unit can effectively operate in a realistic combat environment. The Army should consider reestablishing the Patriot Test Battalion to help address both Patriot and THAAD training deficiencies.

MODELING AND SIMULATION

Realistic flight tests of BMD systems are expensive, and there is no practical way to conduct a flight test for all possible BMD scenarios. Hence, verified, validated and accredited modeling and simulation, grounded in flight test data, is required to ensure BMD systems will be effective in combat. My BMDS assessments are limited by the lack of properly accredited modeling and simulation. As the MDA executes its flight test program over the next several years and additional validation data are gathered, the MDA should ensure those data are used to improve the Agency's modeling and simulation capabilities. This effort will require dedicated resources and the support of MDA leadership.

My BMD assessments often contain subjective content due to the limited amount of flight test data and the limited progress toward verification, validation, and accreditation of the BMDS models and simulations. This is especially true for the GMD program. Many of the models and simulations used in BMD system ground testing are still not accredited for performance assessment, thereby limiting quantitative assessments based on their results. I recommend strongly that the MDA work with the Congress to assure robust funding enabling timely development and rigorous accreditation of the models and simulations critical to understanding and assuring the effectiveness of all elements of the BMDS, including, in particular, GMD.

IMTP ASSESSMENT

Admiral Syring leads a rigorous IMTP development process that has produced a well-justified set of tests within a budget-constrained environment. In 2014, the MDA continued to emphasize operational realism when planning for and conducting both ground and flight testing and my office continues to be involved substantively with each update of the IMTP. The process has enabled the IMTP to be revised in a timely manner consistent with policy changes, flight test results, and changes in budgetary resources. The IMTP continues to be a defensible and rigorous plan for obtaining the test information needed to assess BMDS performance more quantitatively over time.

Chairman SESSIONS. Thank you, Dr. Gilmore. I know that you are the director of the Office of Test of Evaluation. You take pride in your independence. You might share with the committee how it is that you're structured as to give you independent analysis on what we're funding and the testing of it.

Mr. GILMORE. Well, under the law, my office reports directly to the Secretary of Defense, as well as to the Congress, on the effectiveness, suitability, and survivability of weapon systems. Under subsequent NDAAs, we were given full access to information from the Missile Defense Agency, notwithstanding its removal from the normal acquisition oversight process in the department.

I have worked very cooperatively with both Lieutenant General O'Reilly and Admiral Syring. There has been a complete free flow of information between our offices. I have found our interactions to be very useful, and I would invite Admiral Syring to make any comments he wants to make in that regard, obviously.

But Admiral Syring and no one else in the department reviews or coordinates on the reports that I write, including the report that I just recently submitted to Congress, which is mandated by a past National Defense Authorization Act (NDAA), although they can certainly point out if we have made any mistakes, and so far, no one has done that.

Chairman SESSIONS. That is unusual.

Let me just say this, we have a lot to do, but I do think it is important that we have an independent evaluator not in the normal chain of command that reviews these key activities, because they are complex, and we need to be careful about it.

Admiral Syring, we are going to be adding the 44 Ground-based Midcourse Defense System (GBIs), and we have the plans to bring forward the newer, updated Capability Enhancement-2 (CE–II) kill vehicle.

But then again, you want to move forward with the Relativistic Kill Vehicle (RKV). The RKV will be a new and more advanced system that could defend against simultaneous attack from North Korea or Iran by 2025, as I understand it.

So explain to us what advantages we get from the RVK. Are the plans moving forward technologically as you would like? Do you foresee any engineering problems that would be difficult or impossible to overcome?

Admiral SYRING. Sir, thank you.

The plan for the RVK was started last year, and it was started because of the concerns that we have had with the early design of the EKV, which has evolved over the years with different versions. But essentially, the prototype nature of the design has remained, in terms of it was fielded very rapidly and without a complete sys-

tem engineering turn, which I have testified on publicly in the past.

The RVK will allow us to take a step back with what we have learned and design a kill vehicle that is modular, producible, testable, before we flight test. I think that is very important, to be able to have that modularity and test at the component level and find issues on the ground before you find them in flight, as we have experienced.

We need to get the reliability up of the overall GBI, and the RVK will do that as we begin to field in 2020 with the pace up to 2025 not yet defined. But if that is successful, we will want to field that very rapidly back to the older Capability-enhancement-1 (CE–I) fleet and some of the older CE–IIs, and upgrade all 44 in a very short amount of time, hopefully.

Chairman SESSIONS. You have 44. We are going to 44. This new kill vehicle, what can you tell us in this open session about the advantages of making the 44 missile interceptors more effective and valuable with this Redesigned Kill Vehicle.

Admiral SYRING. Sir, to make the best use of the 44 that will be in the ground by 2017, there are two fundamental issues that improve our capability and capacity. One is the reliability of the interceptor, and two is the discrimination capability of the system. Those two fundamental precepts go into defining the Northern Command commanders shot doctrine and his use of interceptors to defeat more threats with more complexity.

Chairman SESSIONS. Well, I will talk to you about that. I think we have had closed hearings on that. I think you are on the right track. I think that is a smart step. It will make each one of those 44 interceptors more valuable.

What about the Multi-Object Kill Vehicle, the MOKV? You said in your prepared statement, ultimately, these Multi-Object Kill Vehicles will revolutionize our missile defense architecture.

What kind of revolutionary advance would that be? How confident are you that it can be done? Do we have, at this point, the funding necessary to keep it on track?

Admiral SYRING. Sir, let me take that in parts.

Several years ago, we explored technology and matured technology to a point on the Multiple-Object Kill Vehicle, the MKV, at the time, up to a point where the department decided that the technology was not maturing fast enough. The requirements were really not firm. For a whole bunch of reasons that I am not familiar with at a detailed level, that was terminated. Secretary Gates was eloquent in the BMDR on those reasons that are available.

That said, ultimately, we want to be able to get Multiple Kill Vehicles into a complex discrimination scene to be able to shoot less interceptors that can go after multiple lethal objects. That is what the MKV, MOKV, can bring to us.

Now, sir, we have asked for money in this year's budget to ramp that effort up. It is not a program yet. We have requested money to get us down the path of concept development and to revisit the technology and to understand where that technology is today, and then come back with a program plan on how best to achieve that.

But I can assure you, sir, it will be done independently, in terms of not concurrently with what is going on with the RVK. The RVK

will, certainly, inform our assessment of the feasibility of an MOKV, but it is not a new development effort at this point. I would characterize it as a concept development effort with us doing a lot of work this year to define that better.

Chairman SESSIONS. Well, thank you. The way I understand this, you are talking about having a system that can identify more accurately the nontargets instead of junk, going after junk, having multiple kill vehicles on one rocket launch vehicle, and be more effective. So it will multiply the capabilities of the interceptors that we have.

Admiral SYRING. Yes, sir.

Chairman SESSIONS. Senator Donnelly?

Senator DONNELLY. Thank you, Mr. Chairman. Thanks to all the witnesses.

Admiral Syring, you testified before other committees on this particular topic I am going to ask you about, but for the public record of this committee, does our current ground-based missile defense system cover all the United States, including the East Coast, against potential threats from North Korea and Iran?

Admiral SYRING. Yes, sir.

Senator DONNELLY. You have also stated that the greater priority for investment is improving your sensors, your discrimination capabilities, and the overall reliability of the GMD system. Could you describe how this will address the evolving threat?

Admiral SYRING. The threat is from North Korea, and let me just take North Korea first.

The threat from North Korea is, at least at the short-range level, increasing in complexity. We have to assume that technology at the short- and medium-range level will eventually migrate to the longer range level.

So the complexity of the threat must be accounted for, and the potential of that to increase, and we must be prepared for that. That is the whole premise of the discrimination radar, to be able to better defend against a more complex threat with fewer interceptors.

Senator DONNELLY. There has been some discussion regarding Defense Intelligence Agency's (DIA's) assessment of Iran's Intercontinental ballistic missile (ICBM) capability. Are you familiar with this assessment? Can you clarify a little bit for us?

Admiral SYRING. Thank you for the opportunity to clarify what I said at the hearing last week.

The DIA's assessment is that Iran is capable of flight testing an ICBM in 2015. There is not a likelihood expressed with that assessment. Any future assessment, I will leave to DIA as they evaluate that this year.

Senator DONNELLY. Thank you.

Secretary McKeon and General Mann, what is the department's plan for responding to the high demand for THAAD and Patriot systems? Are there options you are looking at to increase the coverage or flexibility of these systems?

Mr. MCKEON. Senator Donnelly, as you are aware, we have a lot of stress on the Patriot force, and we have more demand from the COCOMs for Patriot battalions than we have in the Army.

We are working on a modernization on the Patriot, which will effectively allow them to deploy without the headquarters unit, which will allow us to have more units able to deploy. We will be able to significantly increase the number of deployable battalions. So that modernization program is going on over the next several years.

General MANN. Yes, Senator. In addition to what the Secretary has also shared, as you know, there is a holistic review that is taking place. There are a lot of different studies that are underway, led by the Joint staff, looking at how we address an evolving threat.

Quite frankly, it goes beyond just the number of active defense platforms, whether Ballistic Missile Defense (BMD) ships, or Patriot, or Terminal High Attitutude Area Defense (THAAD). We really need to take a broader look at it, at the dilemma, and really try to leverage, whether cyber, electronic warfare, attack operations, where instead of waiting until after the missile is shot, go after the archer, as Admiral Gortney likes to say. So that is one of the things that we are looking at.

Also, we are looking at nonkinetic applications, like directed energy. A lot of applications, a lot of promise in those technologies. They are still being developed. MDA is looking at some of that directed energy and where it could be applied against ballistic missiles.

In the Army, we are looking at how we can use directed energy. We have had a lot of very, very successful tests against mortars and unmanned aerial vehicles (UAVs), and how can we utilize directed energy and also our indirect fire protection capability to address the cruise missile threat.

So there are a lot of modernization efforts. But also, we need to look more holistically versus just the number of platforms you put out there.

Senator DONNELLY. Okay.

I guess, Dr. Gilmore, this would be a follow-up to that question, which is in your prepared statement, you expressed concerns with the amount and quality of training that our soldiers are getting on THAAD and on Patriot.

Could you elaborate a little bit on this? Are there ways that this committee can help solve that problem?

General Mann, if you would also kick in on this.

Mr. GILMORE. It all comes down to resources. There are a finite number of resources, in terms of training capability, training aids, simulators. The Army has a plan to improve those training aids and training systems for both THAAD and Patriot over the long run.

But as the other members of the panel have testified, there is a great deal of demand for the use of these assets, and there is a large number of deployments that are ongoing. So the pace of training in what we have seen in tests isn't keeping up with the demand and isn't keeping up with the increasing complexity of the capabilities of the system as they are modernizing. That is true, in particular, of Patriot.

So I think it is a matter of resources. In a resource-constrained environment, Admiral Syring and the Services have to make hard

judgments. If there are high demands for deploying these systems and having a larger number of systems, it is possible that some of the training can be given—

Senator DONNELLY. General, I'm about out of time, if you want to kick in for a few seconds?

General MANN. Yes. First of all, I just want to make sure that I assure this committee that our soldiers are properly prepared to execute operations. Naturally, it would be great to have a test battalion capability that we have had in the past. But because of the demand for this capability, we have had to use that test battalion to meet operational requirements. So I just want to make that very clear to the committee.

We are looking at training aids and devices that we can use to help with the training and getting after that. We continue to raise the level of difficulty with our testing and our exercises, and continue to push the envelope in terms of presenting a challenging scenario for our soldiers to get after.

This goes back to my earlier comments about the importance of sequestration. I don't want to belabor the point, but when you are looking at the effects of sequestration, not only does it have an impact on the readiness, which we are talking about, but on how we are able to address some of these evolving threats that are out there with new technologies. That is the reason why we are very, very concerned.

Senator DONNELLY. Thank you, General.

Thank you, Mr. Chairman.

Chairman SESSIONS. Senator Fischer?

Senator FISCHER. Thank you, Mr. Chairman, and thank you, gentlemen, for being here today.

Admiral, as we look at the threats out there, what benefits do you see if we would deploy the Sea-based X-band Radar (SBX) to the East Coast, given the threats that we are looking at with Iran, especially in 2020 into 2025? Wouldn't additional sensor capabilities be beneficial, even necessary?

Admiral SYRING. Thank you for your question, ma'am.

Let me start with the last. Yes, additional sensor capabilities are not just nice to have but will be necessary beyond what we have asked for in this budget.

Second, SBX is fulfilling a very important role today in the Pacific, with all the testing that we do and for a surge capability that we provided to the Northern Command commander when the situation arises.

That is the importance, ma'am, of what we are doing with the continued request of the long-range radar in Alaska, some thinking about additional sensor capability in Hawaii.

I think, in that priority order, when those are complete, you will see us offer the option to the Northern Command commander to move SBX to the East Coast. That will be his decision, and it will be predicated on the ability to do our testing in the Pacific, giving comfort to him that he is covered in an operation, if he needs the platform.

I think we have it right, in terms of the priority of that order, in terms of North Korea certainly, as the DIA has said, can flight

test at any time. We are focused on that assessment and that very real threat today in the Pacific.

Senator FISCHER. If you would, though, be looking at the possibility of deploying it to the East Coast, how much lead time would you need for that?

Admiral SYRING. The approvals would have to happen, and it would be months, not years.

Senator FISCHER. Have you broached the topic at all with NORTHCOM command?

Admiral SYRING. Not on a formal level, in any way.

Senator FISCHER. Do you know how it would be paid for and who would man it?

Admiral SYRING. The request this year is roughly $70 million a year for the limited test support that it provides today in the underway time. I assume we would assess that budget adequacy for the future and the operational need on the East Coast.

Senator FISCHER. Where you would say it would take months, not years, to have this completed, are you comfortable with that in assessing the threats that are before us?

Admiral SYRING. Yes, ma'am. I am comfortable with what I understand, in terms of where Iran is today and the development of their ICBM technology and that threat.

Senator FISCHER. Thank you.

Mr. McKeon, has the department looked at any policy, at improving the sensor capabilities, as we look to the growing threats from Iran?

Mr. MCKEON. Well, Senator, as Admiral Syring just said, the SBX in the Atlantic would be an option down the line, once we get our long-range discrimination radar in place in Alaska to face the North Korean threat. That is the focus right now, improving our sensor capability against North Korea.

Senator FISCHER. Do you agree that we would have plenty of lead time with the threats from Iran that we are going to be facing I think in the not too far future?

Mr. MCKEON. Yes, I believe so. Our current system is still adequate to deal with the current Iranian threat and how we expect it to evolve in the next several years.

Senator FISCHER. Is the department, though, taking any formal policy discussions on this?

Mr. MCKEON. We have not had that at my level. If somebody has at a lower level, it hasn't bubbled up to me. I can double check for you, Senator, but I don't think we have taken a formal policy review of this question.

Admiral SYRING. If I may, sir, there is an extensive sensor angle of attack (AOA) that the department is conducting. It is looking at all sensor options for many different applications, but missile defense is part of that. It, certainly, will account for our need on the East Coast in the future.

I would also add, if I can, that the work we have done with integrated data terminal in Fort Drum, the System Data Terminal (IDT) in Fort Drum that will come online in 2017, helps us a lot with the Iranian threat today. I'm very comfortable and the warfighter is very comfortable with that increasing capability that will be online here.

Senator FISCHER. Thank you very much.

Thank you, Mr. Chairman.

Chairman SESSIONS. Thank you.

Senator King?

Senator KING. Gentlemen, you may have heard that there is an idea kicking around here to end-run the Budget Control Act and the sequester by pumping up the Overseas Contingency Operations (OCO) funds.

Have you done any analysis of how that would actually work and where that money would go within the department? Would that help with your issues? Talk to me about this idea.

Mr. MCKEON. Senator King, I don't know that we have done a formal analysis. That would probably be the comptroller who would be looking at that. In terms of Admiral Syring's budget, there is not any money requested in the OCO. It is all in the base. So I'm not sure it would make much of a difference for missile defense.

Senator KING. My understanding of this idea is just to send a bunch of OCO money to the Pentagon and say, do with it what you will. I may be incorrect.

Is that the way you are hearing it?

Chairman SESSIONS. That has some truth to it. [Laughter.]

Not completely so.

Senator KING. All right, I don't know the details, but my question is, if there was an additional $50 billion of OCO money, would it end up with you? Perhaps you just don't know at this point, because we don't know the details of what this proposal looks like.

Admiral SYRING. Sir, I don't know. I don't know the mechanics of that.

Senator KING. Okay.

General MANN. Senator, if I could just add, though, because I think there has been discussion about the President's budget versus the House version of what you are alluding to. I can just say that it would be very, very important to really look at the base versus OCO. Because of predictability and making sure that our programs are stable over years versus episodic rises in the budget and falling off the next year, we would be recommending that the base be looked at.

Senator KING. That is a very important point. In other words, a one-time OCO infusion doesn't necessarily—in fact, given your sort of by definition long-range program, it would not be necessarily all that helpful. That is your testimony?

General MANN. Obviously, we would be thankful for any additional resources that we would be given, but where you place them, again, I think placing them in the base would be a lot more advantageous to our programs.

Senator KING. Thank you. There are many of us trying to find a way to do that.

How much does one GBI missile with kill vehicle cost?

Admiral SYRING. The budget number today, in today's costs, we don't have any requested this year, Senator. The request for additional GBI starts out in 2018. The budget number is $75 million each, buying two per year.

Senator KING. That leads me to my next question. You mentioned directed energy. It seems to me that is a very promising de-

velopment, because the cost of each missile, if you will, or railgun would be in the dollars instead of millions dollars. Is that part of your calculus?

Admiral SYRING. Yes, sir. We are requesting this year an increase in directed energy funding, which is detailed in the budget that we have submitted for continued technology maturation, and then demonstration of a down-select of a technology by 2018, and then a demonstration by 2020 of a low-power directed energy platform.

Senator KING. Directed energy wouldn't work at the top, at the apogee. Where would it come into play? On the downward slope or on the upward slope?

Admiral SYRING. So two applications, sir, in terms of how we view directed energy. There are other parts of the Ballistic Missile Defense System (BMDS) that it will help with, and I will just leave it at that, in an unclassified setting.

Senator KING. Thank you.

Admiral SYRING. But there is no doubt a boost phase intercept concept that we pursued with airborne laser in the last decade, that the technology that I am working on today with electric lasers, solid-state lasers, would build upon that success in a different technology.

Senator KING. Would sequestration impact that budget for this development of this directed energy program?

Admiral SYRING. Yes, sir. It would impact everything in terms of the numbers that are being talked about. I cannot get all of that budget reduction out of just the new start programs, which are critically important. There are other parts of the Missile Defense Agency (MDA) budget that we would have to go to maintain the commitment of 44 GBIs by 2017, and our European commitment as well.

So, no doubt, directed energy would be impacted.

Senator KING. That would be pennywise and pound foolish, in my view.

To what extent is this whole program reliant on satellite information?

Admiral SYRING. I will keep it unclassified, sir.

Senator KING. To the extent you can.

Admiral SYRING. The Overhead Persistent Infrared assets, specifically the Small Business Innovation Research (SBIR) program, that brings Defense Support Program (DSP) and the Low Earth Orbit (LEO) and Highly Elipitical Earth Orbits (HEO) satellites, provide the initial detection of the lunch at the areas that we are interested in.

Senator KING. So the persistence and vulnerability or lack thereof of our satellite assets is an important part of this whole strategy?

Admiral SYRING. Absolutely.

Senator KING. Because we have had testimony on that subject as well. I think that is something we need to pay close attention to, in terms of where we go in our satellite strategy.

Admiral SYRING. I would agree.

Senator KING. Thank you.

Thank you, Mr. Chairman.

Chairman SESSIONS. Senator King, I think it is still incumbent on the Congress, when we appropriate money for the Defense Department Overseas Contingency Operating and base budget, to set forth where those monies are going to be spent. So we have to pay real attention to that in our authorizing and Appropriations Committee. I think the numbers that they have asked for, for this program, at the President's budget, we ought to try to achieve that.

I think there will be a way to do that, but I appreciate your concern. It is worth talking about.

Senator Sullivan, we are glad to have you on the committee.

Senator SULLIVAN. Thank you, Mr. Chairman.

Chairman SESSIONS. You bring the Alaska perspective.

Senator SULLIVAN. Yes. As a matter fact, I was going to talk a little bit about that to begin with.

Senator DONNELLY. We are stunned to hear that, Senator Sullivan. [Laughter.]

Senator SULLIVAN. No rolling of the eyes, gentlemen. [Laughter.]

Gentlemen, first, thank you for your service. I really, really appreciate it. I was looking at everybody's bio and it is just decades of service to our country. So I am very appreciative of that.

I am going to start out a little bit, and I think this is important only for my constituents to hear but for the Congress, the American people. You may have seen the Secretary of Defense in his confirmation hearing was very focused after an exchange he had with me on agreeing with the famous quote from Billy Mitchell, the father of the U.S. Air Force, that Alaska was the most strategic location in the world.

Can you just give me a very quick sense, because I know you can probably go on forever, but you are free to use superlatives, just how important in terms of location Alaska is with regard to the country's missile defense?

General MANN. I will go ahead and start.

First of all, Senator, I am a big fan of those missile defenders you have up there that provide 24/7 coverage, those National Guardsmen, full-time National Guardsmen. But its location on the Earth, its proximity to North Korea and to the polls, I think is critically important.

So from a strategic homeland defense standpoint, it is critical, where it is located.

Senator SULLIVAN. Thank you.

Admiral?

Admiral SYRING. From a material developer, technology standpoint, in terms of the location of Alaska, there is a reason that we are there with the GBIs at Fort Greely. There is a reason that I am working with the NORTHCOM commander and STRATCOM commander on putting another radar in Alaska, because of that strategic importance to the threat from North Korea.

Senator SULLIVAN. Great. Thank you.

I do want to talk about the strategic threat and follow up on Senator Fischer's concerns.

I am sure you have seen both classified and even public reports that have come out recently about both the strategic threats from North Korea, from Iran. Johns Hopkins had a report recently that, by 2020, North Korea could have as many as 100 nuclear weapons.

Given the concerns that we are now seeing with regard to Iran and the negotiations that some of us have a lot of concerns about, are we in danger of falling behind the evolving North Korean or even Iranian ICBM threat, nuclear threat? What would falling behind mean for cities like Anchorage or L.A. or New York?

Admiral Syring?

Admiral SYRING. Sir, let me take it.

The Secretary's announcement back in 2013 to increase GBIs from 30 to 44 was in direct response to the escalation that we see in North Korea.

Senator SULLIVAN. Okay.

Admiral SYRING. Numbers matter in terms of what that was able to provide in a very short amount time.

We see North Korea and Iran continuing to progress.

Senator SULLIVAN. Right.

Admiral SYRING. In terms of not just the numbers of ICBMs they may have, but the complexity of what those threats may represent to us. That is why the budget request this year is so important, that we get the radar built and are able to stay ahead of the threat in terms of its complexity, and make the best and most efficient use of the 44 that we have in the ground.

Senator SULLIVAN. So of course, we appreciate the 44 and think that is a good idea. If we see the threat continuing, though, is there capacity? Do you think we could possibly need at Fort Greely beyond the 44? Will we need it? Let's assume this threat gets beyond what we are anticipating today in 5 years.

Admiral SYRING. The capacity, I will call it surge capacity, the extra capacity in Fort Greely does exist.

Senator SULLIVAN. Okay.

Admiral SYRING. That would be assessed on how we see the numbers, in terms of threats from North Korea progressing. Certainly, that would be an option available to the Secretary of Defense, to use that capability. That option would be, I think, weighed in terms of how those would be used versus future discrimination radar to the East Coast as well, in terms of how Iran may progress, and the complexity of that threat as well.

Senator SULLIVAN. Okay. You are talking radar. I do want to focus for a minute on the Long Range Discrimination Radar (LRDR) program.

Can you give us just an update on the proposal, when the decision on the location will be made? Who actually makes that decision? Is that MDA? Is that contractors? What are the tradeoffs between the two different Alaska locations you are looking at?

Admiral SYRING. First, on the program, we have received proposals from the contractors, and our plan is to award by the end of this fiscal year.

Senator SULLIVAN. Great.

Admiral SYRING. That said, we do need a location decision and we are working closely with NORTHCOM and STRATCOM on that location. Since I am the material developer, I need their warfighter input on the best location for performance. Certainly, cost and schedule play to that as well.

Senator SULLIVAN. Okay.

I am glad you mentioned you are working because you know one of the things in Alaska, we are kind of at the seams. We are very important militarily but we are at the seams of NORTHCOM, STRATCOM, PACOM, EUCOM. I mean, we kind of fall into all those different areas.

Let's assume, if there were a location chosen at Clear, what is the power usage that we would be looking at with regard to that kind of significant radar system?

There is a coal facility being shut down. A lot of us are questioning why that was happening, whether it was strategic or whether it was some kind of clean air initiative that I didn't think it belonged in the DOD strategic outlook.

What would be the kind of power generation required for that kind of radar system? Should we be looking at shutting down power generation in that part of Alaska when we might need a surge of power generation that is obviously not happening at Clear right now?

Admiral SYRING. Sir, in the interest of competition sensitivities with the ongoing competition on the radar today, I would like to take that to a closed session.

Senator SULLIVAN. Sure. Again, I am not at all trying to get involved in one way or the other, in terms of location. It is just a question. You probably know there was a GAO study that was requested on that.

Admiral SYRING. Yes, I do. I would be happy to share my thoughts with you privately on that.

Senator SULLIVAN. Great. Thank you.

Thank you, Mr. Chairman.

General MANN. Senator, one thing, you asked about the decision, where it is going to be made. I can tell you that MDA and STRATCOM and NORTHCOM are working very, very closely together and will provide a recommendation to the department.

So I am sure that at very, very high levels, that is where the decision is going to be made.

Senator SULLIVAN. Great. That is expected soon?

Admiral SYRING. Sir, within the next several months.

Senator SULLIVAN. Great. Thank you.

Thank you, Mr. Chairman.

Chairman SESSIONS. Admiral Syring, just briefly, first, I believe the money you requested is appropriate, and I don't mean to suggest otherwise. But I asked you some questions earlier about, could we see savings as technology matures? I thought it was some good news, colleagues.

Maybe you can give us some expectations as developments of these systems go forward. The per copy price isn't going to continue to go up, but might actually drop some.

Thank you for your focus on cost. It is important.

Admiral SYRING. Sir, it is the agency's focus, and they embrace it every day. It is a matter of getting the results that we are after.

I think this is a good news story on where we believe, after evaluating three of the contractors' proposals that ultimately we decided to use as a team in terms of how we are structured, with the government as the design authority with support from the three major contractors.

Chairman SESSIONS. What project is this you are talking about?

Admiral SYRING. All the prices were very——

Chairman SESSIONS. What project is this?

Admiral SYRING. This is for the new kill vehicle.

Chairman SESSIONS. The new kill vehicle.

Admiral SYRING. The Redesigned Kill Vehicle. Our price objective would be in the neighborhood of $15 million for the new kill vehicle. I think that is achievable. I know that is achievable. That would be a huge savings over what we pay today, which is upwards of $35 million a kill vehicle.

Chairman SESSIONS. It will be a considerably improved vehicle, too, right?

Admiral SYRING. Yes, sir, because we have given the team the runway and the space to system engineer it with the right amount of time and the right effort from the beginning.

Chairman SESSIONS. General Mann, have you seen any ideas of that kind, Space and Missile Defense Command (SMDC) or others, that save money?

General MANN. We continue to look at directed energy, and I think, like Admiral Syring was saying, that has a lot of promise. We have a high-energy laser mobile demonstrator that has been very, very effective against 60 mm mortars and UAVs. It also has the ability capability of the tracking beyond 30 klicks, 30 km.

We think it has a lot of promise. Right now, it is at the 10 kW level. We expect by 2017 to have it up to the 50 kW, giving us the capability to address cruise missiles more effectively.

As far as from a cost savings, when you are able to use directed energy or something like that versus an interceptor, there is a significant cost savings. So we are very encouraged by a lot of our tests.

Chairman SESSIONS. Well, good. I remember, after much concern, we did not advance with the airborne laser concept, but it looks like we're coming forward with some new ideas that are more plausible.

Admiral Syring, do you want to comment on that?

Admiral SYRING. Sir, I would say that and I would say that Dr. Gilmore's organization has been very helpful in helping us strive for alternatives to reduce the cost of testing, in targets and test layout. We have had a close relationship on that. I have to say, it is across the department, in terms of focus on that.

Chairman SESSIONS. Good. That is good news.

We are going to have a vote at 4:45. Any other questions?

Senator KING. Just a quick question. Could you give us an update on the status of the Environmental Impact Statement's (EISs) for the ground-based sites, U.S.-based?

Admiral SYRING. Senator King, thank you. There are four sites that are being evaluated, one in Maine, one in Ohio, one in Michigan, and one in New York. Those sites are well-known.

That activity has progressed very well. We are going to need another season this summer for refinement of the analysis that we took last summer, and we will go out with a draft by the end of the year for public comment. I think you will see us get that through the department for publication in the 2016 timeframe.

Senator KING. If you could find some excuse, I would urge you to come to Maine this summer.

Admiral SYRING. Maine is beautiful in the summertime.

Senator KING. Yes, sir.

Senator DONNELLY. Does that include the entire committee, Mr. King?

Senator KING. An inspection trip, yes, sir.

Senator DONNELLY. I wanted to ask, is it your priority to fix the problems in the GMD system, and to demonstrate those fixes in realistic intercept tests before we build or deploy any additional interceptors?

Admiral SYRING. Yes, sir. That is the premise of the entire test plan that I have laid through the Future Years Defense Program (FYDP).

Senator DONNELLY. Let me ask just one other one, which is the Aegis Ashore site in Poland is expected to be completed by the end of 2018.

Is Poland asking for additional capabilities?

Mr. MCKEON. Senator Donnelly, they have talked to us, not about additional capabilities along the lines of Aegis Ashore, but they have talked to us about Patriots.

They are investing in a big program, a big buy upwards of $10 billion in integrated air and missile defense, and our Patriots are one of the competitors for that, and they are going to be making that decision in the near future. We have been talking to them very actively.

What we have said to them about their request for Patriots is, as was discussed earlier with you, we don't have a lot of spares in the inventory, but we have talked to them about having some exercises and occasional rotations of Patriots into Poland. In fact, there is an exercise going on this month in Poland with the Patriot unit.

Senator DONNELLY. Thank you.

Thank you, Mr. Chairman.

Chairman SESSIONS. Senator Sullivan?

Senator SULLIVAN. Mr. Chairman, I just have two quick questions, follow up.

Gentlemen, with regard to Fort Greely and the requested budget, it is a strategic location. As you know, it is also an incredibly harsh environment. It is below zero there much of the winter and pretty remote.

Are there areas that are not funded in the budget or budget areas that you are focused on that focus on ground system upgrades or even just capacity upgrades at Fort Greely?

Admiral SYRING. Sir, when I talk about the need to modernize the GMD system, the ground system is a big part of that. That is included in this year's budget request.

Senator SULLIVAN. Right.

Admiral SYRING. Vitally important to keep up the reliability of the overall system.

Senator SULLIVAN. But I am talking about any facility upgrades or anything that is in addition, or that you see that is not in the budget right now.

General MANN. Quite honestly, Senator, I have some really good news because the Army has made some significant investments in

the infrastructure there at Fort Greely. We are about to open up later on this year a medical facility that is much-needed up there.

So we are trying to bring them up, in terms of the quality-of-life. It is a very, very harsh environment, and the Army is really stepping up.

Senator SULLIVAN. Great. Thank you, General.

Then finally, you have obviously a hugely important mission. We are talking about an austere, in some ways, budget environment. You have many priorities.

Can you just list what you would say are your top three or four right now, so we have a real solid understanding of that?

Admiral SYRING. The homeland defense system and everything that is being asked for in this budget, and the need to get to 44 GBIs by 2017 is, certainly, my top priority and the department's top priority for missile defense.

A close second is the regional capacity and capability of the European phased adaptive approach and all the other regional commitments that we have made around the world.

Senator SULLIVAN. Okay.

General?

General MANN. In addition to that, I look at it two ways. I look at it from homeland defense standpoint, and Admiral Syring has talked a lot about the different improvements to the EKV system. But we are also looking at the regional, so Patriot modernization is critically important. The battle command system that we have for Patriot, where we get away from stovepipes and we're able to bring our different systems using one command-and-control system, a network, we're able to optimize our components versus having to deploy, as the Secretary was talking, a full Patriot battalion. Being able to use a network where you can break it up into pieces, cover more space more effectively and more cost informed is another thing that we are getting after.

Then the third modernization effort that we would really ask for the committee's support is the indirect fire protection system. That will help us really get after the cruise missile threats that are out there, as well as being part of the networks.

So modernization efforts are critically important, upgrades to the Patriot radar. This is a very, very old system, as you well know, and heavily utilized.

Senator SULLIVAN. Thank you.

Thank you, Mr. Chairman.

Chairman SESSIONS. Thank you. That is very good. I appreciate that.

We may submit further questions for the record.

Chairman SESSIONS. I believe that we have excellent leadership in these programs, and we thank you for that. The committee is ready to respond, if you have a new breakthrough that could make us more effective and you need to alter the course we are on. But in general, I believe the course that you have laid out, Admiral Syring, General Mann, is a sound course. Our committee has been supportive and will continue to be.

Anything further that you would like to add before we break?

Thank you very much. We are adjourned.

[Whereupon, at 4:35 p.m., the subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR MARTIN HEINRICH

DIRECTED ENERGY

1. Senator HEINRICH. Admiral Syring and General Mann, in the House of Representatives, I founded the first-ever Congressional Directed Energy Caucus. I am a strong supporter of directed energy and remain a strong supporter of directed energy applications for military purposes, including missile defense. Can you provide an update to the committee on what programs you are pursuing as it relates to directed energy and missile defense?

Admiral SYRING. Our vision is to shift the calculus of our potential adversaries by introducing directed energy into the Ballistic Missile Defense System (BMDS) architecture. This will revolutionize missile defense, dramatically reducing, if not eliminating, the role of interceptors.

Our long term goal is to use megawatt-class lasers on high altitude; long endurance unmanned aerial vehicle platforms to destroy intercontinental ballistic missiles in the boost phase at long standoff ranges. To achieve this vision we must prove two key elements: laser scaling to megawatt-class with high efficiency and excellent beam quality; and demonstration of a high altitude, long endurance aircraft to carry the laser and its beam pointing and control system.

Our President's Budget 2016 request funds a structured plan that includes laser power scaling in the laboratory in parallel with reducing the risk of integrating a laser system onto an airborne platform and testing it in the field. The agency is pursuing two promising laser technologies today: Combined fiber lasers (MIT Lincoln Laboratory) and diode pumped alkali lasers (Lawrence Livermore). We are demonstrating high electrical-to-optical efficiency with excellent beam quality at incrementally increasing power levels in the laboratory.

Lincoln has demonstrated up to 34 kW, with a plan to reach 50 kW, in a compact form factor, by 2018. Livermore has demonstrated 5 kW, and is on track to demonstrate 10 kW by May of this year with a plan to reach 120 kW by 2018. We are also monitoring the steady gains made by industry both in laser power and packaging.

This year, we are bringing industry into the game by funding six month study contracts with five prime integrators; Boeing, General Atomics, Lockheed Martin, Northrop Grumman, and Raytheon, to define concepts and assess the feasibility, schedule and cost of building and testing an airborne laser. In fiscal year 2016, we will award a contract to one of the five to integrate a laser into an aircraft and "piggyback" BMDS tests at the Pacific Missile Range Facility in 2020 to prove missile defense missions at lower power. In the 2025 time frame, our goal is to integrate a compact, efficient, high power (megawatt-class) laser into a high altitude, long endurance aircraft capable of carrying that laser and destroying targets in the boost phase.

General MANN. USASMDC/ARSTRAT manages the high energy laser (HEL) program for the Deputy Assistant Secretary of the Army (Research & Technology). This program includes basic research, applied technology development, and advanced technology demonstration through the High Energy Laser Mobile Demonstrator (HEL MD) effort. The HEL MD integrates the laser source, power, and thermal management subsystems for the laser—a beam control subsystem that tracks and directs the laser energy to the intended target—and a command and control subsystem which interfaces with an external queuing radar. The HEL MD, using a modified 10 kilowatt (kW) commercial laser, demonstrated the ability to shoot down lightweight mortars and small unmanned aerial vehicles (UAVs) in 2013. Future demonstrations at more weapon-relevant power levels (50–100 kW) will occur in fiscal years 2017–2022. These configurations will demonstrate robust performance against rockets, artillery, mortars, UAVs, and a subset of the cruise missile threat. The demonstrations will provide valuable data to support decisions regarding a future program of record for a laser weapon system that is complementary to kinetic energy capabilities.

A laser weapon system for ballistic missile defense applications will require significantly higher power levels, and we are working in cooperation with the Missile Defense Agency to support their directed energy development activities.

2. Senator HEINRICH. Admiral Syring and General Mann, Iron Dome is a program has been extremely successful (80 percent success rate) but each Iron Dome Tamir missile that Israel fires—and usually two are sent up to intercept each descending rocket—costs at least $50,000. Are we pursuing anything similar to what Israel has

developed in the form of their directed energy Iron Beam system to protect against short-range rockets, artillery shells, and mortar bombs?

Admiral SYRING. The Missile Defense Agency's (MDA) efforts are focused on activities to defend the U.S. homeland, deployed forces, and international Allies and friends from ballistic missile threats. MDA is not focused on defense against shorter-range rockets and mortars. MDA is investing in directed energy technology, but only from a ballistic missile defense perspective. I defer to the U.S. Army on Department of Defense investments to address these shorter-range threats.

General MANN. Yes, USASMDC/ARSTRAT is developing and demonstrating laser weapon capabilities to complement kinetic energy capabilities in countering rockets, artillery, mortars, unmanned aerial vehicles (UAVs), and cruise missiles. This work is done on behalf of the Deputy Assistant Secretary of the Army (Research & Technology). The cornerstone of our high energy laser program is the High Energy Laser Mobile Demonstrator (HEL MD) effort. The HEL MD, using a modified 10 kilowatt (kW) commercial laser, demonstrated the ability to shoot down lightweight mortars and small unmanned aerial vehicles in late 2013. Future demonstrations at more weapon-relevant power levels (50–100 kW) will occur in fiscal years 2017–2022. These configurations are expected to demonstrate robust performance against rockets, artillery, mortars, UAVs, and a subset of the cruise missile threat.

IRON DOME CO-PRODUCTION

3. Senator HEINRICH. Admiral Syring, in August 2013, I sent a letter to you and then-Secretary Hagel voicing support for co-production of Iron Dome. I later secured an amendment in the Fiscal Year 2014 National Defense Authorization Act (NDAA) authorizing $15 million for the production of the Iron Dome short-range rocket defense system in the United States. To date, the United States has provided nearly a billion dollars to Israel for Iron Dome batteries, interceptors, and general maintenance. Despite these significant investments, the United States had not shared in production of this missile defense system until now. What kind of progress has been made on Iron Dome co-production?

Admiral SYRING. The United States and Israel signed the Iron Dome Procurement Agreement in March 2014. This agreement provides U.S. fiscal year (FY) 2013–2015 funding to procure Iron Dome components for the defense of Israel.

The agreement includes spending requirements for Israel to obligate over $260 million (M) to U.S. suppliers from DOD funding provided in fiscal years 2014 and 2015. Thus far, contracts for co-production in the U.S. have been awarded to Raytheon ($149.3 million) and Elta-North America ($12.6 million). I anticipate Israel will reach the $260 million goal.

As the prime U.S. subcontractor to Israeli industry (Rafael), Raytheon is on track executing the current co-production program, providing Iron Dome component deliveries through the end of fiscal year 2018. Twenty of twenty-three Raytheon purchase orders were awarded and the remaining orders are estimated to be finalized by the end of April 2015.

Overall, twenty-six suppliers located in twenty different states are currently involved with U.S. co-production of Iron Dome subcomponents. An additional procurement contract for Tamir missile hardware is expected to fully exercise all funding through fiscal year 2015. The terms of this contract have not been finalized. U.S. delivery timeline for additional quantities will be finalized with an expected contract award between Rafael and Raytheon by December 2015.

Additionally, Raytheon has received all technical data packages required for U.S. co-production of Iron Dome components. The DOD closely monitors the program and receives regular Industry and Israel Missile Defense Organization updates on program status.

4. Senator HEINRICH. Admiral Syring, given the near-billion-dollars the United States has provided in assistance for this critical system, do you foresee a path toward eventual full production, as opposed to component production, in the United States to support American jobs?

Admiral SYRING. U.S. suppliers are on track to produce 70 percent of Iron Dome components for Israel security purposes. For the U.S. to produce, integrate and test the remaining 30 percent of components, additional factors will need to be addressed to include security, transportation, special equipment, and transfer of technical data packages. The non-recurring engineering / recurring engineering cost to develop the U.S. production capability to co-produce the Tamir Interceptor is estimated at over $175 million. In addition to the established costs, facilities capable of producing, integrating and testing the All-Up-Round in the U.S will be necessary. Depending on the total future procurement, this option may not be cost-effective.

5. Senator HEINRICH. Admiral Syring, do you envision co-production for other systems such as David's Sling?

Admiral SYRING. The Department of Defense is considering Israel's request for full-rate production of the David's Sling Weapon System and Arrow-3 interceptors and coordinating a consolidated position.

ELECTRONIC WARFARE

6. Senator HEINRICH. Secretary McKeon, given the complexity and difficulty of missile defense, the enormous costs of each launch, and the vast number of incoming missiles that an adversary could potentially overwhelm U.S. missile defense systems, what steps are being taken in the realm of "left of launch" technologies such as electronic warfare and cyber that could blind, deceive, or burn enemy's sensors before they launch?

Mr. MCKEON. DOD continues to explore a wide range of technologies to defeat missiles in all phases of flight and "left of launch." Ballistic missile defense systems will remain a vital component of protecting our territory and forces from ballistic missile attack, and we will continue to pursue technologies to enhance our capabilities to defend against such threats.

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2016 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, APRIL 15, 2015

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

THE NATIONAL NUCLEAR SECURITY ADMINISTRATION PLANS AND PROGRAMS

The subcommittee met, pursuant to notice, at 2:34 p.m. in room SR–222, Russell Senate Office Building, Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Sessions, Fischer, Graham, Donnelly, King, and Heinrich.

OPENING STATEMENT OF SENATOR JEFF SESSIONS, CHAIRMAN

Senator SESSIONS. Good afternoon. Our subcommittee will come to order.

I thank all of you for being here, and we look forward to our good meeting.

The Strategic Forces Subcommittee will receive testimony on the NNSA [National Nuclear Security Administration's] plans and programs for fiscal year 2016 and the Future Years Defense Program.

We are pleased to have NNSA [National Nuclear Security Administration] Administrator Frank Klotz and his colleagues: Dr. Donald Cook for defense programs; Anne Harrington, Deputy for Defense Nuclear Nonproliferation; and Admiral John Richardson, Director of the Office of Naval Reactors. We are also pleased to have with us Mr. David Trimble, Director of Natural Resources and Environment for the GAO [Government Accountability Office].

As I stated on March 4th at that hearing with our Nuclear Weapons Council Chairman, Mr. Frank Kendall, the President's fiscal year 2016 budget request and out-year spending profiles represent a good faith effort given our financial difficulties, an effort that can help us modernize the nuclear triad and address the aging Department of Energy [DOE] nuclear weapons infrastructure problems.

The President's budget request for nuclear weapons activities, $8.9 billion, meets the funding target established during the 2010 New START [Strategic Arms Reduction Treaty] ratification process.

Administrator Klotz, I am hopeful that though funding constraints and in some cases poor management over the years have delayed NNSA modernization plans, the course you have charted over the next 2 decades I think is sound. And I want to congratulate you on certain cost containment measures. Your creative building review, created some using modular designs, has saved as much as $3 billion on two major buildings. So that is the kind of smart management we like to celebrate. So I wanted to thank you for that.

So moving forward, I think that we are on a path to achieve the requirements we have for our Nation rather than, as we have so often been doing in recent years, just pushing things out further and further into the future.

Based on the geopolitical situation today and as far as I can see into the future, I believe you will have the necessary congressional support. We want you to be frugal, all of you, and manage well, but I hope today that you can assure me that NNSA will be able to execute without huge cost overruns or delays.

Looking ahead, it is apparent that future costs will be significant. NNSA's estimates for three planned interoperable warheads in the 2020–2040 timeframe have grown substantially. So it raises the question, is there more cost-effective design and production processes that can help contain these costs in the future.

Finally, I would note that this is the first time the Strategic Forces Subcommittee will review defense nuclear nonproliferation programs, Ms. Harrington. While this work continues to receive less attention maybe than in the past and our activities with weapons today, NNSA's activities to prevent, counter, and especially respond to the threat of nuclear proliferation and terrorism is extremely important.

With that, Ranking Member Donnelly, I will turn it over to you for comments and thank you for your strong and effective contributions to this subcommittee.

STATEMENT OF SENATOR JOE DONNELLY

Senator DONNELLY. Thank you, Mr. Chairman. I want to thank Senator Sessions for arranging this hearing and today's witnesses for agreeing to take time from your schedules to testify on a topic that is very important to the subcommittee.

The National Nuclear Security Administration is the busiest it has ever been since it was created in 2000. It is overhauling our entire stockpile while struggling to keep our weapons scientists at the forefront to hedge against future uncertainties. It is providing critical expertise on issues related to negotiations on Iran's centrifuges and reactors. It is servicing the Navy's nuclear fleet while designing a reactor plan for the Ohio replacement submarine. Most of these efforts are long-term with little room for slippage in milestones.

Four years ago, the NNSA was plagued with cost and schedule overruns. My impression today is that the management team under the leadership of Administrator Klotz, Madelyn Creedon,

and all of you seem to be making headway in getting everything back on track. In that regard, I hope today's hearing will help us find out more about what the NNSA is doing to rein in cost growth to ensure the programs remain on track.

Let me again thank today's witnesses for coming, and we look forward to your testimony.

Senator SESSIONS. Thank you, Senator Donnelly.

I believe, Administrator Klotz and Mr. Trimble, you have agree that you two would have opening statements, and please commence, General Klotz.

STATEMENT OF HON. FRANK G. KLOTZ, UNDER SECRETARY FOR NUCLEAR SECURITY, AND ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION, DEPARTMENT OF ENERGY; ACCOMPANIED BY HON. DONALD L. COOK, DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS, NATIONAL NUCLEAR SECURITY ADMINISTRATION, DEPARTMENT OF ENERGY; HON. ANNE M. HARRINGTON, DEPUTY ADMINISTRATOR FOR DEFENSE NUCLEAR NONPROLIFERATION, NATIONAL NUCLEAR SECURITY ADMINISTRATION, DEPARTMENT OF ENERGY; AND ADM JOHN M. RICHARDSON, USN, DIRECTOR, NAVAL NUCLEAR PROPULSION AND OFFICE OF NAVAL REACTORS, NATIONAL NUCLEAR SECURITY ADMINISTRATION, DEPARTMENT OF ENERGY

Dr. KLOTZ. Chairman Sessions, Ranking Member Donnelly, and members of the subcommittee, thank you for the opportunity to present the President's fiscal year 2016 budget request for the Department of Energy's National Nuclear Security Administration.

I am pleased to be joined by my esteemed colleagues here today that you have already introduced.

We have also provided the subcommittee a written statement and respectfully request that it be submitted for the record.

Senator SESSIONS. It will be made a part of the record.

Dr. KLOTZ. Thank you, sir.

We value this committee's leadership in national security, as well as its robust and abiding support for the mission and the people of NNSA.

Our budget request, which comprises more than 40 percent of the Department of Energy's budget, is $12.6 billion. This is an increase of $1.2 billion, or 10.2 percent, over the fiscal year 2015 enacted level. This funding is extraordinarily important to NNSA's missions to provide and maintain a safe, secure, and effective nuclear weapons stockpile, to prevent, counter, and respond to the threat of nuclear proliferation and terrorism, and to support the capability of our nuclear-powered Navy to project power and protect American and allied interests around the world.

By supporting growth in each of our four appropriations accounts, this budget represents the commitment by the administration to NNSA's vital and enduring mission and to NNSA's role in ensuring a strong national defense.

This mission is accomplished through the hard work and innovative spirit of a highly talented workforce committed to public service. To provide them the tools they need to carry out their complex and challenging tasks both now and in the future, we must con-

tinue to maintain and modernize our scientific, technical, and engineering capabilities and infrastructure. In doing so, we are mindful of our obligation to continually improve our business practices and to be responsible stewards of the resources that Congress and the American people have entrusted to us.

To this end, NNSA continues to make progress on key surveillance and life extension programs which directly support the President's direction to maintain a safe, secure, and effective nuclear arsenal. Funding at the fiscal year 2016 budget request level will ensure that these key life extension programs stay on track.

For NNSA's important mission to reduce nuclear dangers, the fiscal year 2016 budget request shifts funding for our counterterrorism and emergency response missions to the defense nuclear nonproliferation account in order to better align funds across the spectrum of activities related to preventing, countering, and responding to nuclear threats.

Additionally, the nuclear nonproliferation programs have been realigned into four business lines that better reflect the core competencies resident across that program.

And the request for naval reactors? mission provides funding for three major initiatives, the *Ohio*-class reactor plant system development, the land-based prototype refueling overhaul, and the spent fuel handling recapitalization project in Idaho.

For all of these missions, NNSA will continue driving improvements in acquisition and program management practices and policies and Federal oversight of the enterprise.

Those highlights are just a handful of the critical national security work that this budget funds. However, if our appropriation from Congress remains at the Budget Control Act level for fiscal year 2016, NNSA's ability to meet our mission requirements will be at risk. In developing the budget, NNSA was directed to request the funds we need to accomplish the missions we have been tasked to do. The fiscal year 2016 budget request reflects this guidance. Any significant reduction to the amount would disrupt the science, technology, and engineering work taking place at our laboratories and plants, work that underpins our National security and broader national security missions.

Again, sir, I thank you for the opportunity to appear before you today.

[The prepared statements of Dr. Klotz and Admiral Richardson follow:]

PREPARED STATEMENT OF LT. GEN. FRANK G. KLOTZ, USAF (RET)

Chairman Sessions, Ranking Member Donnelly, and Members of the Subcommittee, thank you for the opportunity to present the President's Fiscal Year (FY) 2016 Budget Request for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). We value this Committee's leadership in national security, as well as its strong and abiding support for the mission and people of the NNSA.

The President's Fiscal Year 2016 Budget Request for NNSA, which comprises more than 40 percent of the DOE's budget, is $12.6 billion, up $1.2 billion or 10.2 percent over the fiscal year 2015 enacted level. The NNSA has a unique and special responsibility for maintaining a safe, secure, and effective nuclear weapons stockpile for as long as nuclear weapons exist; preventing, countering and responding to evolving and emerging threats of nuclear proliferation and terrorism; and, supporting the capability of our nuclear-powered Navy to project power and protect

American and Allied interests around the world. By supporting growth in each of our four appropriations accounts, this budget request represents a strong endorsement of NNSA's vital and enduring mission, and is indicative of the Administration's unwavering commitment to a strong national defense.

The NNSA's mission is accomplished through the hard work and innovative spirit of a highly talented workforce committed to public service. To provide them the tools they need to carry out their complex and challenging task, both now and in the future, we must continue to modernize our scientific, technical and engineering capabilities and infrastructure. In doing so, we are mindful of our obligation to continually improve our business practices and to be responsible stewards of the resources that Congress and the American people have entrusted to us. The NNSA took several significant steps toward this objective during the past year.

NNSA's Fiscal Year 2016 Budget Request reflects the close working partnership between NNSA and the Department of Defense (DoD) in providing for our Nation's nuclear deterrence capabilities and modernizing the nuclear security enterprise. As in last year's Budget, DoD is carrying a separate account in its Fiscal Year 2016 Budget Request for the out years, fiscal year 2017 and beyond, which identifies funds for NNSA's Weapons Activities and Naval Reactors. We urge this Subcommittee's support for alignment of its appropriations process and national defense or "050" allocations, including the subcommittee 302(b) allocations, with the President's Budget. The requested allocation supports NNSA and DoD priorities.

Tough decisions and trades in fiscal year 2016 have been made to meet military commitments and nuclear security priorities. If the request is not fully supported, modernization of our nuclear enterprise and implementation of our long-term stockpile sustainment strategy could be put at risk. The program we have proposed is highly integrated and interdependent across the stockpile management, science and infrastructure accounts.

Apart from the need for national defense allocation alignment, *the looming possibility of sequestration is a major threat* to all NNSA missions. The NNSA Fiscal Year 2016 Budget Request exceeds the caps set on national security spending in the Budget Control Act (BCA); but is necessary to meet our national security commitments. Reduced funding levels will place these commitments at risk. We have made some tough resource decisions across the NNSA, but the Secretary of Energy and I believe that our enduring missions are too vital to the Nation's security to be further constrained by the current BCA spending caps.

Details of the Fiscal Year 2016 President's Budget Request for the NNSA follow:

WEAPONS ACTIVITIES APPROPRIATION

The Fiscal Year 2016 Budget Request for the Weapons Activities account is $8.8 billion, an increase of $666.6 million or 8.1 percent over fiscal year 2015 enacted levels. It is comprised not only of the Defense Programs portfolio, which is responsible for all aspects of stockpile stewardship and management; but also the enterprise-wide infrastructure sustainment activities managed by our Office of Safety, Infrastructure and Operations, as well as our physical and cybersecurity activities. It should be noted that in this budget request we have moved NNSA's on-going emergency response and counterterrorism and counterproliferation capabilities out of the Weapons Activities account and into the Defense Nuclear Nonproliferation account. This action aligns activities for preventing, countering and responding to global nuclear threats into a single account.

Maintaining the Stockpile

Last year, we again successfully used science-based stockpile stewardship to certify to the President that the American nuclear weapons stockpile remains safe, secure, and effective—without the need for underground nuclear testing. It is important to periodically remind ourselves that we have been able to do this every year largely due to the investments we have made and continue to make in state-of-the-art diagnostic tools, high performance computing platforms, and modern facilities staffed by extraordinarily talented scientists, engineers and technicians.

For *Directed Stockpile Work (DSW),* the fiscal year 2016 request is $3.2 billion, a $494.7 million increase over fiscal year 2015 enacted levels, or about 18.4 percent. Approximately $133 million of this increase reflects a restructuring of the accounts when compared to the fiscal year 2015 budget request. These changes are discussed below.

With respect to the major life extension programs (LEP), we have now passed the halfway mark in the production phase of the W76–1 LEP. This LEP, which directly supports the Navy, is now on track and on budget. Our fiscal year 2016 Request of $244.0 million will keep us on track to complete production in fiscal year 2019.

We are also making significant progress in the engineering development phase of the B61–12 LEP. The B61 is a gravity bomb associated with Air Force long-range nuclear-capable bombers, as well as dual-capable fighter aircraft. Working with the Air Force, we successfully completed environmental flight tests on the F–15, F–16, and B–2 aircraft on or ahead of schedule. The B61–12 LEP will enter Phase 6.4 Production Engineering in 2016; and, with the $643.3 million requested, we will remain on track to deliver the First Production Unit (FPU) in fiscal year 2020.

Based on results from the ongoing surveillance of the nuclear weapons stockpile performed by NNSA's laboratories and plants, the Nuclear Weapons Council decided that it was prudent to expand the planned W88 Alteration (ALT) 370 to now include replacement of the conventional high explosive in the warhead. The budget request reflects this decision and includes $220.2 million to support the FPU in fiscal year 2020.

The budget request also includes $195.0 million to support the Nuclear Weapons Council decision to accelerate by two years an LEP of the W80 to serve as the warhead for the Air Force's Long Range Stand-Off system (LRSO). FPU is now slated for 2025.

This budget request also supports our goal of dismantling all weapons retired prior to fiscal year 2009 by fiscal year 2022. In fact, we have already dismantled more than 42 percent of these weapons in 38 percent of the time allotted. This funding will ensure that we stay on track to meet our dismantlement commitment.

Within DSW, the budget request also includes $415.0 million for a new "Nuclear Materials Commodities" subprogram to support the investment needed in nuclear materials to maintain the viability of the enduring stockpile. Included in this subprogram are Uranium Sustainment, Plutonium Sustainment, and Tritium Sustainment which are all crucial to sustain our stockpile, even as we move to lower levels in our nuclear stockpile. Since last year, we have created and empowered new program manager positions to oversee each of these nuclear materials programs. Also included within DSW, is a subprogram for Domestic Uranium Enrichment. Ensuring we have a domestic uranium enrichment capability for national security needs is particularly important in maintaining a domestic source of LEU to produce tritium and for research reactor conversion program and eventually to produce HEU for Naval Reactors fuel.

Consistent with the Consolidated and Further Continuing Appropriations Act for Fiscal Year 2015, activities formerly carried out under Campaigns are now included under *Research, Development, Test, and Evaluation (RDT&E).* The funding request for RDT&E is about $1.8 billion, essentially the same as the fiscal year 2015 enacted level. This includes $623.0 million for the Advanced Simulation and Computing (ASC) Program, an increase of $25.0 million for the Advanced Technology Development and Mitigation (ATDM) subprogram that supports high performance computing; $130.1 million for Advanced Manufacturing Development, an increase of $22.9 million. This funding will support work related to electronics-based arming, fusing, and firing, as well as other technologies that require significant technical effort to ensure production readiness for manufacturing technologies needed to replace sunset technologies. We continue to develop and mature additive manufacturing technologies that can provide significant cost avoidance by reducing costs to prototype and manufacture tooling and certain weapons components. These increases are largely offset by relatively small decreases in the Science (-$22.5 million for a total request of $389.6 million), Inertial Confinement Fusion Ignition and High Yield Program (-$10.4 million for a total request of $502.5 million), and Engineering (-$4.6 million for a total request of $131.4 million) Programs.

The Inertial Confinement Fusion Ignition and High Yield program has spearheaded ongoing improvements in both management and operational efficiencies at NNSA's major high energy density (HED) facilities, including the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory (LLNL). As a result of these improvements, LLNL has been able to increase the shot rate at NIF. NNSA recently completed a 10-year HED Science Strategic Plan to guide work in this important field.

Partnering with the DOE Office of Science, NNSA continues to make much needed investments in exascale computing. NNSA's ASC Program provides leading edge, high-end modeling and simulation capabilities to sustain and modernize the stockpile today and into the future. The fiscal year 2016 Request includes $64 million for the ASC's Advanced Technology Development and Mitigation subprogram to pursue long-term simulation and computing goals relevant to the exascale computing needed to support the broad national security missions of the NNSA. Both the NNSA and DOE's Office of Science continue to collaborate with the Office of Science providing $209 million towards the development of capable exascale systems.

Defense Programs also supports the vitality of the broader National Security Enterprise. An important aspect of this is investing in Laboratory-, Site- and Plant-Directed Research and Development (LDRD). Independent reviews have consistently affirmed the importance of the program to the long-term vitality of the labs. LDRD provides basic research funding to foster innovation and to attract and retain young scientific and technical talent. Congressional support is essential to sustaining this essential national capability.

Finally, another important accomplishment within Weapons Activities in 2014 was the renewal of the Mutual Defense Agreement with the United Kingdom. Since 1958, this enduring agreement has enabled mutually beneficial exchange of nuclear expertise between the United States and UK, contributing to a long and proud history of defense cooperation between our two nations. In this case, the Administration and the Congress worked closely together to achieve a shared goal. We are truly grateful for your support.

Improving Safety, Operations and Infrastructure

In order to support all of these critical programmatic activities, we are making important strides in recapitalizing our aging infrastructure throughout the enterprise. In August 2014, DOE and NNSA formally dedicated the new National Security Campus (NSC) in Kansas City, Missouri. The former Kansas City Plant was relocated from the Bannister Federal Complex, a 70-year-old facility, to the NSC with half the footprint and a modern operating environment. The move was safely and securely completed one month ahead of schedule and $10 million under budget. The NSC manufactures or purchases 85 percent of the non-nuclear components that make up our nuclear weapons, and thus plays a major role in keeping the Nation's nuclear stockpile safe, secure and effective.

The fiscal year 2016 request restructures many of the activities formerly conducted under the Readiness in Technical Base and Facilities (RTBF) into the Infrastructure and Safety program. This new program will maintain, operate and modernize the NNSA general purpose infrastructure in a safe, secure, and cost-effective manner. Infrastructure and Safety efforts are organized around five elements—Operations of Facilities; Safety Operations; Maintenance; Recapitalization; and, Line Item Construction. Together, these elements provide a comprehensive approach to arresting the declining state of NNSA infrastructure. The fiscal year 2016 request for Infrastructure and Safety is $1.5 billion and reflects an increase of $79.4 million for comparable activities from the fiscal year 2015 enacted level. This funding will allow NNSA to modernize and upgrade aging infrastructure and address safety and programmatic risks.

We are developing a 10-year strategic plan that identifies the activities NNSA is undertaking to arrest the declining state of NNSA infrastructure, reduce Deferred Maintenance (DM), and dispose of excess facilities. The major elements of the plan include improving infrastructure decision-making with implementation of new, risk-informed analytical methods to better evaluate the ability of an asset to support program core capabilities; improving program management tools through implementation of standardized and automated processes and systems for scope, cost, and schedule management; accelerating recapitalization and construction efforts to revitalize infrastructure and make better use of the resources by strategically procuring common systems and components used across the enterprise; and shrinking the NNSA footprint by deactivating and disposing of excess facilities, with increased focus on timely deactivation and on repurposing and reuse as a strategy to avoid new construction. Within this 10-year plan, the transferring of the old Kansas City Bannister Road facility to a private developer to repurpose the site for local community use will eliminate $250 million in DM. We recognize that these goals will not be met quickly, and that arresting the declining state of NNSA infrastructure will require steady commitment at all levels of the organization over many years. We believe that the tools and processes we are developing and implementing, along with sustained investment in our infrastructure, will set NNSA on the right path to ensuring a viable, safe, and effective nuclear security enterprise well into the future.

The Infrastructure and Safety program addresses the needs of program specific infrastructure, primarily the Uranium Processing Facility (UPF) and the Chemistry and Metallurgy Research Replacement (CMRR) project. RTBF provides a defined level of readiness and capability through infrastructure investments and strategy development that are dedicated to special nuclear material processing and inventory management. The RTBF program accomplishes this mission by modernizing stockpile stewardship and management infrastructure through capability investments, strategic development, and line-item construction projects for the sustainment or enhancement of capabilities. The fiscal year 2016 request is $1.1 billion, with a reduction of $1.4 billion, due to the transfer of select activities to Infrastructure and Safe-

ty. For comparability purposes, the fiscal year 2016 request for RTBF is increased more than 50 percent to support a new source of high-purity depleted uranium, to realign recapitalization of Defense Programs capabilities through the Capabilities Based Investments (CBI), and to increase funding for the UPF at Y–12 to $430.0 million and the CMRR Project at the Los Alamos National Laboratory (LANL) to $156.0 million.

Last year, NNSA successfully executed one of the largest and most complex contract transitions in the history of the Department with the award of a contract to Consolidated Nuclear Security to operate and manage both the Pantex Plant and the Y–12 National Security Complex. The consolidated contract was written to require efficiencies and improved operations as a requirement for continued performance beyond the initial five-year base period. This is a departure from other management and operating contracts where efficiencies and effectiveness are considered but are not mandatory.

Our Office of Secure Transportation (OST) provides safe, secure movement of nuclear weapons, special nuclear material, and weapon components to meet projected DOE, DoD, and other customer requirements. It continues to modernize assets by extending the life of the Safeguards Transporter and is currently looking at options for the next generation transporter, the Mobile Guardian Transporter. To meet an increasing workload, OST is planning a small increase in the number of federal agents.

The primary mission of NNSA's Office of Defense Nuclear Security (DNS) and the Chief Security Officer is to develop and implement sound security programs to protect Special Nuclear Material (SNM), people, information, and facilities throughout the nuclear security enterprise. The NNSA's *Defense Nuclear Security Fiscal Year 2016* request is $632.9 million. The request manages risk among important competing needs even as NNSA continues to face the challenges associated with an aging physical security infrastructure that must be effectively addressed in the coming years. The request includes $13 million to initiate installation of Argus at the Device Assembly Facility at the Nevada National Security Site. Argus is the enterprise security system for Category 1 SNM facilities that integrates access control, intrusion detection, and video assessment of alarms to protect and control high-consequence assets. DNS also has a prioritized list of smaller infrastructure upgrade projects it will execute as General Plant Projects within available O&M funding, for example, lighting systems supporting perimeter camera assessment, replacement and upgrades to Argus Field Processors, replacement of ported coax cables and buried cable electronics that will extend lifecycles and delay total system replacements. DNS initiated an Enterprise Vulnerability Assessment process across the enterprise with a focus on standardizing how vulnerability assessments are conducted and site protection strategies are formulated.

The *Information Technology and Cybersecurity* fiscal year 2016 request is $157.6 million, a decrease of $22.1 million or about 12.3 percent from fiscal year 2015 enacted levels. The difference is attributed to a one-time investment in fiscal year 2015 in the Infrastructure Program to implement a more secure classified computing environment. All activities related to the one-time increase were completed. Information Technology and Cybersecurity supports the nuclear security enterprise. This work includes continuous monitoring and enterprise wireless and security technologies (i.e., identity, credential, and access management) to help meet security challenges. In fiscal year 2016, NNSA plans to complete the recapitalization of the Enterprise Secure Network, modernize the Cybersecurity infrastructure, implement the Identity Control and Access Management project at NNSA Headquarters and site elements, and implement and coordinate all Committee on National Security Systems and Public Key Infrastructure capabilities. In addition, we will leverage the NNSA Network Vision framework to increase the efficiency and cost-effectiveness of NNSA Information Technology (IT) services.

DEFENSE NUCLEAR NONPROLIFERATION APPROPRIATION

In fiscal year 2016, we have realigned the NNSA programs that continue to support the President's Prague Agenda to address the threat of nuclear proliferation and terrorism into the Defense Nuclear Nonproliferation (DNN) appropriation. NNSA's activities work across the spectrum to prevent, counter and respond to the threat of nuclear and radiological proliferation and terrorism. We work to prevent the acquisition of nuclear or radiological materials, technology, and expertise; we actively counter efforts to develop the materials and scientific knowledge needed to construct a nuclear threat device; and we are poised to respond to terrorist acts by searching for and rendering safe any such devices.

The Defense Nuclear Nonproliferation (DNN) account request is $1.9 billion, an increase of $325 million or about 20.1 percent from fiscal year 2015 enacted levels. At first glance, this figure looks like a very big increase but the number actually reflects a reorganization of our budget to include the Nuclear Counterterrorism Incident Response (NCTIR) and the Counterterrorism and Counterproliferation (CTCP) Programs from the Weapons Activities account. For comparability purposes, the DNN account increase is $101.0 million or over 5 percent above fiscal year 2015 enacted levels. Additionally, we have combined the NCTIR and CTCP programs into a single budget program line to eliminate confusion about NNSA nuclear counterterrorism programs and activities. We also changed the NCTIR name to Nuclear Counterterrorism and Incident Response Program, reflecting this realignment. The DNN Appropriation will now support two enduring mission areas: 1) The Defense Nuclear Nonproliferation Program and 2) The Nuclear Counterterrorism and Incident Response Program. The Nuclear Nonproliferation Program is also restructuring to place more emphasis on capabilities as opposed to specific programs. This organizational restructuring is reflected in the DNN budget restructuring.

To achieve all of these mission objectives, NNSA has restructured the budget request under the Defense Nuclear Nonproliferation account as follows:

- Material Management and Minimization
- Global Material Security
- Nonproliferation and Arms Control
- Defense Nuclear Nonproliferation R&D
- Nonproliferation Construction
- Nuclear Counterterrorism and Incident Response Program.

Together, this restructuring aligns funding for preventing, countering, and responding to global nuclear dangers in one appropriation.

Nonproliferation Efforts

The fiscal year 2016 request for the DNN Program, excluding NCTIR and Legacy Contractor Pensions, is $1.6 billion, an increase of $67.9 million or about 4.4 percent above fiscal year 2015 enacted levels. This past year was a big year for our nonproliferation efforts. Our Defense Nuclear Nonproliferation organization was responsible for many of the significant deliverables at the third Nuclear Security Summit held in The Hague last spring. Of particular note, Japan announced at the Summit that it would work with us to remove and dispose of all highly-enriched uranium (HEU) and separated plutonium from its Fast Critical Assembly. NNSA is currently working with its counterparts in Japan to resolve technical and logistical issues to complete this effort in a timely manner.

Also during the Summit, the United States joined 22 countries in signing up to a "Gift Basket" to secure all Category 1 radioactive sealed sources by 2016. In the United States, there are approximately 465 buildings with Category 1 devices. Of these, NNSA has completed security enhancements at 300 and is currently involved in a targeted outreach campaign to engage the remaining 165 buildings by the end of spring 2015.

And finally, NNSA partnered with five countries to remove 190 kg of HEU and plutonium from civilian facilities; which brings our cumulative total at the end of fiscal year 2014 to an impressive 5,207 kg; this is more than enough material for 200 nuclear weapons. While relations with Russia are severely strained, we anticipate that we will continue to cooperate in efforts to repatriate Russian-origin weapons-usable HEU material to Russia.

The *Material Management and Minimization (M3)* program presents an integrated approach to addressing the persistent threat posed by nuclear materials through a full cycle of materials management and minimization efforts. Consistent with the priorities articulated in the National Security Strategy of the United States and the Nuclear Posture Review, the primary objective of the program is to achieve permanent threat reduction by minimizing and, when possible, eliminating weapons-usable nuclear material around the world. This program includes elements of the former Global Threat Reduction Initiative (GTRI) and Fissile Materials Disposition Programs. The fiscal year 2016 request for this program is $311.6 million. For comparability purposes, the request reflects an increase of $38.7 million or about a 14.2 percent increase above the fiscal year 2015 enacted levels. The funding increases are primarily for the removal of HEU from miniature neutron source reactors in Africa as well as preparatory activities for future shipments from Europe and Japan, which will proceed with appropriate cost-sharing.

The *Global Material Security (GMS)* program supports the President's nuclear and radiological security agenda and the Secretary's goal of enhancing nuclear security through nonproliferation. We work with partner countries to increase the secu-

rity of vulnerable stockpiles of nuclear weapons, weapons-usable nuclear materials, and radiological materials, and to improve partner countries' abilities to deter, detect, and interdict illicit trafficking. Elements of the former GTRI program, International Material Protection and Cooperation (IMPC) program, and Nonproliferation and International Security (NIS) program are being combined in GMS, in order to better integrate capabilities required to support DNN's enduring mission. The fiscal year 2016 request for this program is $426.8 million. For comparability purposes the request reflects a slight increase of $2.5 million above the fiscal year 2015 enacted levels. This increase will accelerate the protection of International Atomic Energy Agency Category 1 radiological sources in order to meet the 2014 Nuclear Security Summit commitment to secure these sources by 2016.

The *Nonproliferation and Arms Control (NPAC)* program supports the President's nonproliferation agenda and NNSA efforts to prevent the proliferation or use of weapons of mass destruction by state and non-state actors. To carry out the goals of this program, we work with the International Atomic Energy Agency (IAEA) and foreign partners to build global capacity to safeguard nuclear materials and prevent illicit transfers of dual-use materials, equipment, technology and expertise. We also work with our partners and the IAEA to develop technologies and approaches to verify and monitor current and future arms control treaties and agreements. This funding also supports statutorily mandated activities such as technical reviews of export licenses and interdiction cases, and technical support for the negotiation and implementation of civil nuclear cooperation agreements (123 Agreements), as well as international export control outreach activities, and activities to support and improve the execution of the NPAC 10 CFR Part 810 application process. The fiscal year 2016 request for this program is $126.7 million, and reflects a slight increase of $0.8 million above the fiscal year 2015 enacted level.

The *Defense Nuclear Nonproliferation Research and Development (DNN R&D)* program supports innovative, unilateral and multi-lateral technical capabilities to detect, identify, and characterize: 1) foreign nuclear weapons programs, 2) illicit diversion of special nuclear materials, and 3) nuclear detonations. To meet national and Departmental nuclear security requirements, DNN R&D leverages the unique facilities and scientific skills of the Department of Energy, academia, and industry to perform research, including counterterrorism-related R&D. DNN R&D conducts technology demonstrations, and develops prototypes for integration into operational systems. The fiscal year 2016 request for this program is $419.3 million, a $25.9 million increase or about 6.6 percent above fiscal year 2015 levels. Increased funding is requested for nuclear and energetic materials characterization experiments and development of advanced diagnostic equipment capabilities, for long-range nuclear detonation detection, and technical forensics research. This increase over fiscal year 2015 levels is partially offset by a return to baseline funding for the Proliferation Detection subprogram after a one-time Congressional increase in fiscal year 2015 for test bed development and field experiments.

Nonproliferation Construction consolidates construction costs for DNN projects previously contained within each program budget. Currently, the MOX Fuel Fabrication Facility (MFFF) is the only project in this program. The fiscal year 2016 request for MFFF is $345 million which is the same as the fiscal year 2015 enacted level. The National Defense Authorization Act for Fiscal Year 2015 and the Consolidated and Further Continuing Appropriations Act for Fiscal Year 2015 directed the Department to conduct additional analyses of the MFFF construction project. These analyses will include independent cost and schedule estimates, and examination of alternative approaches for disposition of the 34 metric tons of weapon-grade plutonium and their relationship to the Plutonium Management Disposition Agreement (PMDA). The Department has requested Aerospace Corporation, a federally funded research and development center, to perform these analyses. They will be completed during fiscal year 2015, and will inform a final decision on the path forward. The fiscal year 2016 request emphasizes that while the Department continues to evaluate disposition paths (including the MFFF) to determine the most responsible path forward, any viable alternative will require a significant amount of funds to implement.

Nuclear Counterterrorism and Emergency Response

The fiscal year 2016 Request consolidates counterterrorism and emergency response funding into a single Nuclear Counterterrorism and Incident Response line in the amount of $234.4 million.

Within NCTIR, the Nuclear Counterterrorism Assessment program represents the primary scientific program to assess the threat of nuclear terrorism and develop technical countermeasures against it. The knowledge generated under this program ensures that NNSA's technical expertise on nuclear threat devices informs DoD and

FBI emergency response capabilities. We have taken steps to address funding reductions to the nuclear counterterrorism activities. Over the last two years these activities, formerly known as Counterterrorism and Counterproliferation within the Weapons Activities appropriation, have been funded at a level significantly below the requested amount—70 percent of the Request in fiscal year 2014 and 60 percent in fiscal year 2015. The fiscal year 2016 request would dedicate $57.8M to Nuclear Counterterrorism Assessment in support of improvised nuclear device analysis. Additionally, the request includes funds within Defense Nuclear Nonproliferation R&D for materials characterization experiments and other research, which supports nuclear counterterrorism and incident response missions. Full funding of both lines will make it possible to continue NNSA's vital counterterrorism work at the national laboratories.

NCTIR continues to work domestically and around the world to improve preparedness and emergency response capabilities. Its expert scientific teams and equipment provide a technically trained, rapid response to nuclear or radiological incidents worldwide. NCTIR assesses nuclear or radiological threats and leverages that knowledge to provide contingency planning and training to support national and international counterterrorism and incident response capabilities. In 2014, NNSA's emergency response teams deployed more than 100 times in support of law enforcement and for major public events, such as the Super Bowl, and conducted five large-scale field exercises with partners from the FBI, DoD, and FEMA In addition, they deployed over 70 times in support of DHS Domestic Nuclear Detection Office support to state and local first responders. Internationally, NNSA conducted 16 training courses to improve its foreign partners' emergency management capabilities and continued to work bilaterally with Israel, Vietnam, Cambodia, Thailand, Chile, China, Mexico, Argentina, Brazil, Taiwan, Canada, France, Jordan, the Nordic countries, Armenia and Kazakhstan. New programs were also started with Romania, Belarus and the Philippines. These initiatives represent our effort to create a truly global defense against the threat of nuclear terrorism.

NCTIR will also continue the initiative to equip cities with stabilization equipment and training, to ensure a prompt and effective response to nuclear terror threats.

NCTIR also executes the DOE's Emergency Management and Operations Support program that manages the Emergency Operations Centers, Emergency Communications Network, and Continuity Programs for all of DOE, including NNSA.

NAVAL REACTORS APPROPRIATION

Advancing Naval Nuclear Propulsion

During the past year, NNSA helped celebrate the 60th Anniversary of the USS *Nautilus* first getting underway on nuclear propulsion. The Naval Nuclear Propulsion program pioneered advances in nuclear reactor and warship design—such as improving reactor lifetimes, increasing submarine stealth, and reducing propulsion plant crewing. An example is the technology being developed by Naval Reactors that will enable the *Ohio*-class Replacement submarine to be designed for a 40-plus year operational life without refueling, resulting in significant savings.

During 2014, Naval Reactors continued its record of operational excellence by providing the technical expertise required to resolve emergent issues in the Nation's nuclear-powered Fleet, enabling the Fleet to steam more 2 million miles. Through the work of its laboratory and highly skilled personnel, Naval Reactors also advanced the *Ohio*-class Replacement and the S8G Prototype Refueling projects as well as initiating integrated testing of the lead A1B reactor plant for the next generation *Ford*-class aircraft carrier.

It is generally not well-known that if anything goes wrong with a reactor on one of the Navy's nuclear carriers or submarines while they are at sea, Naval Reactors' cadre of experts provide around-the-clock technical support, and can often resolve the problem and prevent the ship from having to return to port to be checked out and repaired— which would be quite costly and disruptive to the Navy's deployment schedules.

The budget request for *Naval Reactors* is $1.4 billion, an increase of $141.6 million, about 11.5 percent from the fiscal year 2015 enacted level. The request includes the base funding required to safely maintain, operate and oversee the Navy's 83 nuclear-powered warships, constituting over 45 percent of the Navy's major combatants. The increase supports three high priority activities: $186.8 million to continue development of the advanced *Ohio*-class Replacement reactor; $133 million to continue preparations for the refueling and overhaul of the Land-Based Prototype reactor plant; and $86 million to continue the design work of the Spent Fuel Handling Recapitalization Project started in fiscal year 2015. To this end, we would like

to thank the Subcommittee's support for appropriating $70 million for Spent Fuel Handling Recapitalization Project in the fiscal year 2015 enacted budget. These activities are essential to maintaining a credible sea-based strategic deterrent, to maintain the research and training capabilities of the Land-based Prototype, and to maintain the capability to safely inspect, store and package naval spent nuclear fuel.

NNSA FEDERAL SALARIES AND EXPENSES APPROPRIATION

NNSA Federal Salaries and Expenses (FSE) Request is $402.7 million, essentially equal to the rate of operations in fiscal year 2015, but 8.9 percent above the fiscal year 2015 enacted level. The Request provides funding for 1,690 full-time equivalents (FTEs) and support expenses needed to meet mission requirements. We are actively engaged in hiring to that number in a thoughtful and strategic manner. I would note that the Request represents an increase of only $1.5 million from the fiscal year 2015 planned execution level of $401.2 million. This is due to the fact that the fiscal year 2015 enacted level was significantly below the request and we will need to use over $30 million of planned carryover to sustain the currently projected operations of the NNSA federal workforce. We built up that reserve through prudent planning and execution to enable us to pay for large one-time costs, such as the movement of much of our federal workforce in Albuquerque into newer leased space. The increase includes a 1.3 percent cost of living adjustment and benefits escalation, additional support to stand up the Office of Cost Estimation and Program Evaluation (CEPE) office in accordance with Section 3112 of the fiscal year 2014 National Defense Authorization Act (NDAA), and funding to improve financial systems integration within the nuclear security enterprise in accordance with Section 3128 of the fiscal year 2014 NDAA.

In fiscal year 2016, NNSA will continue its on-going efforts to plan strategically to meet current and future workforce needs by analyzing how evolving missions are affecting job requirements. Reshaping of the workforce over the next several years will be essential, including obtaining both the right staffing size and skill sets. NNSA will also continue to identify efficiencies, particularly in travel and support services, to provide a lean and efficient organization and to support the President's Executive Order "Promoting Efficient Spending".

MANAGEMENT & PERFORMANCE

To enhance our ability to carry out our mission and execute this budget request, we will continue to focus on improving our project management and cost estimating capabilities. In keeping with the Secretary of Energy's increased focus on Management and Performance, the NNSA is committed to manage its operations, contracts and costs in an effective and efficient manner. The NNSA's Office of Acquisition and Project Management (APM) is driving continued improvement in contract and project management practices. APM is leading the NNSA's effort to deliver results by instituting rigorous analyses of alternatives, providing clear lines of authority and accountability for federal and contractor program and project management, and improving cost and schedule performance. NNSA participates in the Secretary's Project Management Risk Committee as a means to institutionalize and share best practices across the Department.

We have used strategic partnerships with the National Laboratories to rethink some of our most challenging projects. As a result of the Red Team review of the UPF at the Y–12 National Security Complex, led by the director of the Oak Ridge National Laboratory, and a similar approach to the Chemistry and Metallurgy Research Replacement (CMRR) Facility capability at Los Alamos National Laboratory, we are developing a disciplined, modular approach for both sites that will remove risks early in the process, and establish a well-defined cost and schedule, both of which were lacking in earlier efforts. This process will be an important and recurring project management theme at the NNSA and across the Department of Energy.

The CEPE was established in September 2014 pursuant to the fiscal year 2014 National Defense Authorization Act. This legislation recognized the effort to improve cost estimating that the NNSA had already started. The CEPE office is a prime example of actions taken to improve our cost estimation efforts. Forging a strong partnership with the Department of Defense (DoD) Office of Cost Assessment and Program Evaluation (CAPE), including joint training activities with CAPE, we have made good progress in establishing CEPE as an independent office. CEPE will provide independent cost estimating leadership, rigorous program analysis, and prudent fiscal guidance. Getting CEPE fully functional is a high priority for NNSA, and we will closely monitor its progress as it grows into its full potential over the next few years.

CONCLUSION

The NNSA executes vital missions to ensure nuclear security at home and abroad. We do this by delivering the technology, capabilities and infrastructure essential to a 21st century national security organization. Our workforce continues to rise to the challenge and deliver mission effective and cost efficient nuclear security solutions critical for the NNSA to succeed in today's fiscal climate.

In closing, I would also like to mention that the President's Budget Request is just the first in a series of documents slated for release this spring. The most important of those yet to be released is the NNSA Strategic Plan, last updated in May 2011. The goal of this document is to provide a single integrated guidepost for NNSA's leaders, our partners at the labs and plants, and Congress and our external stakeholders. The new strategic plan will articulate a clear direction and mission to everyone—no matter their rank or position. Also to be released is the Congressionally-mandated Stockpile Stewardship Management Plan (SSMP) which details NNSA's multi-year plan for delivering a safe, secure and effective nuclear stockpile. And for the first time, we plan to release a companion plan to the SSMP, tentatively titled, "Prevent, Counter and Respond" to address our plans for nonproliferation, counterterrorism and emergency response programs. Finally, a report is being prepared for Congress in response to the Final Report from the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise, co-chaired by Norm Augustine and Admiral Rich Mies.

Again, thank you for the opportunity to appear before you today.

PREPARED STATEMENT OF ADMIRAL JOHN RICHARDSON

Since my last testimony before this subcommittee, U.S. Nuclear Powered Warships – 10 aircraft carriers, 14 ballistic missile submarines, 53 attack submarines, and 4 guided missile submarines – operated for another year safely and effectively, steaming more than 2 million miles in support of our nation's interests. Some highlights of those operations include the nuclear-powered aircraft carrier, USS *George H.W. Bush* (CVN 77), the only coalition strike option in the fight against ISIL militants for 54 days, executing 20–30 sorties each day. Our ballistic missile submarine force completed their 4000th strategic patrol, continuing over 50 years of peacekeeping capability through strategic deterrence. The USS *Gerald R. Ford* began her propulsion plant test program and will proudly set sail for the first time next year. The attack submarine USS *North Dakota* (SSN 784) was commissioned in November. We christened the USS *John Warner*, a submarine named after a truly great member of the Senate. We laid the keel for the USS *Illinois*, our thirteenth *Virginia*-class submarine. Finally, this past January, we commemorated a truly historic event for Naval Reactors and the Nation. We celebrated the 60th anniversary of the submarine USS *Nautilus* (SSN 571), the world's first nuclear-powered ship.

Additionally, we finally completed construction and infrastructure projects, some deferred from 2010, to maintain and upgrade the facilities our engineers require to attain these important successes in the fleet. The $75 million Cask Shipping and Receiving Facility in Idaho completed and opened this year under budget and will soon begin receiving shipments of Naval Spent Nuclear Fuel in support of the USS *Enterprise* defueling.

This progress and service to the fleet is only possible through the firm support of this subcommittee. Naval Reactors' request for fiscal year 2016 allows us to continue this work. The funding request is for $1.375 billion, an increase of $136 million (11 percent) over the fiscal year 2015 enacted funding level. The requested funding permits Naval Reactors to continue to support today's operational fleet, as well as deliver tomorrow's fleet by funding three national priority projects. The projects are:

- Designing a new reactor plant for the replacement for the *Ohio*-class SSBN
- Refueling a Research and Training Reactor in New York
- Build a new spent fuel handling facility in Idaho

The fiscal year 2016 request adequately funds all of our requirements: the highly-qualified people, equipment, facilities, and technology development needed to support today's nuclear-powered fleet, and the three projects in support of tomorrow's fleet.

Uncompromising and timely support for safe nuclear fleet operation will always be the highest priority for Naval Reactors. $973 million of my budget request funds the technical support base for the 96 operating reactors at sea on ships and at our training and research sites. The extremely talented men and women, along with the equipment and facilities upon which they depend, stand ready 24 hours per day, 365

days per year to respond to advance the mission and respond to emergent fleet needs for assistance. They are the principal reason that the Program has delivered 60 years of safe and effective operations by ships on station supporting our national interests. The teams at our four Program sites – the Bettis Laboratory in Pittsburgh, the Knolls Laboratory and Kesselring Site in greater Albany, and our spent nuclear fuel facilities in Idaho – perform the research and development, analysis, engineering and testing needed to both support today's Fleet and develop future nuclear-powered warships. Importantly, they perform the technical evaluations that enable me to thoroughly assess emergent issues and deliver timely responses that both ensure nuclear safety and maximize operational flexibility. This technical support base is essential to enabling our submarines and aircraft carriers to deploy.

Funding reductions in fiscal year 2015 most directly impacted this technical support base. The funding levels provided in fiscal year 2015 will result in a delay to the start of the Engineroom Team Trainer facility in upstate New York, a structure that will host a first-of-a-kind nuclear simulation technology. This training simulation technology, when built, will lower the cost and improve the effectiveness of providing nuclear-trained sailors in the future. The delay in building this technology also reduces our future training capacity and will limit the number of nuclear-trained sailors provided to the fleet. I have again requested funding for this essential facility in my fiscal year 2016 request. fiscal year 2015 funding levels also prevented construction of the Central Office and Prototype Staff Buildings in New York. These buildings were planned to accommodate the over 200 engineers and training staff that will arrive at the site in fiscal year 2017–21 to conduct the S8G Prototype Refueling Overhaul discussed below. As a result, I will have to procure, at nearly the same total cost, temporary office spaces and trailers, reducing worker efficiency, effectiveness, and quality of life.

In addition to funding the technical support base, my request in fiscal year 2016 includes $186 million to continue Naval Reactors' efforts in designing a new reactor plant for the *Ohio*-class Replacement. Activity this year includes reactor plant design and component development to support procurement of long lead components starting in fiscal year 2019. Progress in these areas in fiscal year 2016 will ensure that the advanced capability that the life-of-the-ship reactor core provides is delivered in a technically satisfactory and cost effective manner in time to support lead ship construction beginning in fiscal year 2021.

Related to the *Ohio*-class Replacement, the fiscal year 2016 request includes $133 million in funding for the Land-based Prototype Refueling Overhaul in upstate New York. Refueling this reactor supports two major purposes: reducing cost and schedule risk to the life-of-ship core for *Ohio*-class Replacement project and supporting training of about 1000 Sailors per year for the next 20 years. In fiscal year 2015 and fiscal year 2016, Naval Reactors continues the core manufacturing development work needed for the Refueling Overhaul and the plant service life engineering design to ensure that the Land-based Prototype plant overhaul is performed concurrently with the refueling that starts in fiscal year 2018.

Finally my fiscal year 2016 request contains $86 million to continue the Spent Fuel Handling Recapitalization Project (SFHP). Thanks to the support Congress provided in fiscal year 2015, we will complete the facility conceptual design and issue a draft Environmental Impact Statement this year. The fiscal year 2016 request will allow us to publish the final Environmental Impact Statement, set key facility dimensions, and continue to advance the design. Continued support in fiscal year 2016 and beyond is essential to ensure the facility can begin receiving spent fuel from the fleet in fiscal year 2025. Further delays to the project schedule incur costs of approximately $150 million per year to procure shipping containers to temporarily store the spent fuel from aircraft carrier refuelings. Delays to date have incurred over $500M in costs for temporary containers. More of these containers will not be necessary if the project stays on track.

In developing our request, I have worked closely with the leadership of the National Nuclear Security Administration (NNSA), the Department of Energy (DOE), Office of Management and Budget and the Department of Defense. This budget not only reflects my priorities for Naval Reactors but also integrates them with the other important work of my colleagues at NNSA. There is clear recognition of the valuable capabilities Naval Reactors provides and our history in effectively meeting our obligations. I understand the difficult budget environment in which Congress must craft legislation and I respectfully urge your support for aligning allocations with the fiscal year 2016 Budget Request.

Naval Reactors' fiscal year 2016 budget request will ensure that I can meet my statutory responsibilities to maintain a safe and effective nuclear-powered Fleet, continue environmental stewardship at my program sites, and progress *Ohio*-class

replacement, Land-based Prototype Refueling Overhaul and the Spent Fuel Handling Recapitalization Project.

With the help of Congress, Naval Reactors is committed to executing our projects on time and on budget, and I to continue to search for the most cost effective way to support safe operations of the nuclear fleet.

Senator SESSIONS. Mr. Trimble?

STATEMENT OF DAVID C. TRIMBLE, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, GOVERNMENT ACCOUNTABILITY OFFICE

Mr. TRIMBLE. Thank you. Chairman Sessions, Ranking Member Donnelly, and members of the subcommittee, my testimony today is based on our past work and will address NNSA's modernization plans, difficulties in managing programs to cost and schedule, management and governance of the enterprise, and NNSA's nonproliferation programs.

Regarding modernization, GAO annually reviews NNSA's plans and budget estimates for the modernization of the nuclear secured enterprise, and every year that we have reviewed it, significant changes have occurred. The Augustine-Mies Panel also observed that the SSMP has varied from year to year in the cost and schedules for the delivery of LEP's and nuclear facilities, concluding that the lack of a stable, executable plan for modernization is a fundamental weakness for NNSA.

In our 2014 work, we also noted such changes. For example—

Senator SESSIONS. A stable what kind of plan?

Mr. TRIMBLE. I am sorry. I am sorry. Concluding that the lack of a stable, executable plan for modernization is a fundamental weakness for NNSA.

Senator SESSIONS. Okay.

Mr. TRIMBLE. That is from the Augustine-Mies report.

In our 2014 work, we also noted such changes.

Senator SESSIONS. That is the August of 2014 report?

Mr. TRIMBLE. The Augustine-Mies report on governance.

Senator SESSIONS. When was it?

Mr. TRIMBLE. 2014.

Senator SESSIONS. Go ahead.

Mr. TRIMBLE. In our 2014 work, we also noted such changes. For example, in fiscal year 2014, production of the interoperable W78/88 warhead was pushed back 2 years and production of the B61–12 and W88 Alt 370 were also delayed. By fiscal year 2015, the W78/88 LEP was pushed back another 5 years, and the B61 and W88 were each pushed back another year.

NNSA has, however, taken actions to improve its plans. In the fiscal year 2015 plan, NNSA incorporated estimates previously omitted for UPF [the Uranium Processing Facility] and CMRR [the Chemistry and Metallurgy Research Replacement], improved the transparency of some budget estimates and based its LEP estimates on more current data.

Regarding NNSA's contract and project management challenges, much work remains to be done. Modernization plans require NNSA to design and build new large nuclear facilities on time and on budget. Such projects have historically posed a challenge for DOE [the Department of Energy] and NNSA. DOE has shown progress in managing smaller projects, and DOE leadership continues to

demonstrate a strong commitment to address its longstanding contract and project management challenges.

However, our recent high risk report noted that DOE's cycle of identifying root causes and corrective actions raises concerns that DOE has not fully identified the root causes behind its problems. In 2008, DOE issued a corrective action plan which identified root causes, including front-end planning, project funding, accountability, cost estimating management workforce, and project oversight. In 2010, DOE identified six additional barriers and new corrective actions. In 2011, DOE stated that its corrective actions had mitigated most of the root causes of its issues. Most recently in 2014, DOE identified four factors that contribute to project management success or failure. Notably, all four are discussed in DOE's 2008 report and among those that DOE said in 2011 it had at least partially mitigated.

Our recent reports have made numerous recommendations to help DOE in this area, but in some cases, DOE has appeared hesitant to implement them. In our 2014 report on MOX [mixed oxide fuel], we recommended that DOE require a root cause analysis for projects that experience cost increases or schedule delays exceeding a certain threshold, similar to a requirement that DOD [the Department of Defense] has. DOE disagreed with our recommendation.

In 2014, we found that DOE and NNSA requirements for cost estimating and conducting analyses of alternatives generally do not reflect best practices. While DOE agreed with our recommendations to incorporate best practices into requirements, it did not specify a timeline for implementation.

NNSA is embracing a new modular approach to address the mission of both UPF and CMRR. While this approach may simplify the challenge of managing a large construction project, it creates other challenges, including the need to coordinate activities across multiple facilities and the need to renovate facilities that were once expected to close. We plan to examine NNSA's new approaches to both UPF and CMRR this year.

Regarding governance, the Augustine-Mies report highlighted many of the same issues we have reported on, including the management of capital projects, cost estimating, and workforce planning.

The panel also examined NNSA's oversight of its M&O contractors and raised questions regarding the effectiveness of contract requirements and performance metrics on mission execution. We have ongoing work examining NNSA's contract oversight policies and the extent to which it relies on contractor assurance systems for evaluating and rewarding performance. We should complete this work in May of this year.

Finally, regarding nonproliferation, NNSA has made progress in the President's 2009 initiative to secure all vulnerable nuclear material around the world.

Senator SESSIONS. Mr. Trimble, if I could interrupt you. We think it is appropriate, Senator Donnelly and I, that we have a moment of silence for the Boston Marathon bombing. The time is now. So if you would join us in a moment of silence.

[A moment of silence was observed.]

Senator SESSIONS. Okay, move on.

Senator DONNELLY. One other thing that I think Senator Sessions and I would both like to join in on is this is a special day. At 3 o'clock, they are going to give the Congressional Gold Medal to Doolittle Raiders just down the hall. They set a pretty good standard for all of us, and we would like you to keep them in your thoughts today for everything they did for our country.

Senator SESSIONS. That is a good point. I remember as a young kid reading about those brave Americans and that critical event in our history.

All right. Mr. Trimble, I am sorry to interrupt you. You may continue.

Mr. TRIMBLE. I am almost done. No problems.

So finally regarding nonproliferation, NNSA has made progress in the President's 2009 initiative to secure all vulnerable nuclear material around the world, but challenges remain. In 2011, we reported that DNN faced difficulties in ensuring the security of U.S. weapons usable nuclear materials that have been transferred to other nations. DNN's programs heavily depend on the cooperation of other countries. Notably, the decision by the Russian Government to cease joint cooperation with NNSA raises questions about the sustainability of past progress. Last year, NNSA reorganized DNN and has been assessing over-the-horizon nuclear and radiological proliferation threats. We have ongoing work directed by this committee looking at NNSA's long-term nonproliferation planning efforts.

Thank you. I would be happy to answer any questions.

[The prepared statement of Mr. Trimble follows:]

United States Government Accountability Office

Testimony

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NATIONAL NUCLEAR SECURITY ADMINISTRATION

Observations on Management Challenges and Steps Taken to Address Them

Statement of David C. Trimble, Director
Natural Resources and Environment

GAO-15-532T

GAO Highlights

Highlights of GAO-15-532T, a testimony before the Subcommittee on Strategic Forces, Committee on Armed Services, U. S. Senate

April 15, 2015

NATIONAL NUCLEAR SECURITY ADMINISTRATION

Observations on Management Challenges and Steps Taken to Address Them

Why GAO Did This Study

NNSA is responsible for managing the nation's nuclear security missions, which include ensuring a safe, secure, and reliable nuclear deterrent; achieving reductions in the nuclear weapons stockpile; and supporting nuclear nonproliferation efforts (known as DNN programs). NNSA executes its missions at eight sites that make up the nuclear security enterprise.

GAO's reports have highlighted challenges NNSA has faced for several years. These challenges contribute to GAO's continuing inclusion of NNSA's management of contracts and major projects on GAO's list of agencies and program areas that are high risk due to their vulnerabilities to fraud, waste, abuse, and mismanagement, or are in most need of transformation. A recent series of commissions on NNSA's management, governance, and structure—such as the Augustine-Mies Panel—highlights the importance of NNSA's mission.

This testimony is based on eight prior GAO products issued from December 2010 through February 2015 and discusses NNSA's (1) plans to modernize the nuclear security enterprise, (2) understanding of the causes of contract and project management problems and the extent to which it is has implemented GAO's related recommendations, (3) DNN programs' status in securing vulnerable nuclear materials, and (4) challenges in its governance of the nuclear security enterprise.

GAO is not making new recommendations in this statement.

View GAO-15-532T. For more information, contact David C. Trimble at (202) 512-3841 or trimbled@gao.gov.

What GAO Found

The National Nuclear Security Administration (NNSA) faces challenges implementing its plans to modernize the nuclear security enterprise. In its November 2014 report, the Augustine-Mies Panel observed that NNSA's Stockpile Stewardship Management Plan, which is intended to communicate long-range plans and cost estimates, has varied from year to year in the costs and schedules for the delivery of several major life extension programs and nuclear facilities. The panel concluded that the lack of a stable, executable plan for modernization is a fundamental weakness for NNSA. Similarly, GAO found in 2013 that the Stockpile Stewardship Management Plan has shown changes in long-term budget and schedule estimates from year to year—for example, NNSA's stockpile budget estimates for 2014 through 2031 increased by about $27 billion compared with the 2012 stockpile budget estimates for the same time period. GAO recommended that NNSA include in future plans a range of estimates that reflects projects that the agency knows are needed. NNSA agreed and appears to be implementing this recommendation.

As noted in GAO's 2015 high risk report, NNSA has a long history of identifying corrective actions and declaring them successfully resolved, only to follow with the identification of additional actions. As GAO has reported, this suggests that NNSA does not have a full understanding of the root causes of its contract and project management challenges. In its prior reports, GAO has made numerous recommendations to correct NNSA's project management problems. While NNSA has initiated some actions and made some progress, the agency has not taken action on many of these recommendations, including improving cost estimating capabilities and employing a rigorous analysis of alternatives to ensure that key capital asset and program decisions will both meet mission needs and be cost-effective. This suggests a lack of urgency or commitment on DOE's part to address identified challenges.

NNSA's Defense Nuclear Nonproliferation (DNN) programs have made progress securing vulnerable nuclear materials, but significant challenges remain. For example, GAO found in 2011 that NNSA faced challenges accounting for and ensuring the security of U.S. weapons-usable nuclear materials. GAO recommended that NNSA improve its process for securing these materials. Although NNSA disagreed, it has since taken some steps to prioritize its efforts. In addition, prior GAO work has raised concerns about the effectiveness of DNN program management and implementation, particularly with regard to execution of its plutonium disposition program, performance measures, and sustainability.

NNSA faces challenges in its governance of the nuclear security enterprise. The Augustine-Mies Panel highlighted such challenges in its report. The report addresses issues and concerns that GAO has also previously described in its work. For example, consistent with GAO's 2015 update to its high risk list, the Panel noted that NNSA major projects have been a continuing source of program schedule delays and cost overruns and that, as a result, NNSA needs to strengthen its cost estimating capabilities. The report also recommended that NNSA leadership employ a rigorous analysis of alternatives early in the decision process as the basis for assessing and validating program requirements, which is consistent with past GAO recommendations.

Chairman Sessions, Ranking Member Donnelly, and Members of the Subcommittee:

Thank you for the opportunity to discuss our recent work on some of the pressing management challenges the National Nuclear Security Administration (NNSA) is facing.[1] NNSA is responsible for managing the nation's nuclear security missions. These missions—ensuring a safe, secure, and reliable nuclear deterrent; achieving designated reductions in the nuclear weapons stockpile; and supporting the nation's nuclear nonproliferation efforts—are largely executed at eight sites that comprise the nuclear security enterprise. NNSA sites include laboratories, production plants, and a test site, which are owned by the U.S. government but managed and operated by contractors. According to NNSA documents, NNSA's funding has increased steadily from $9.6 billion in fiscal year 2009 to $11.4 billion in fiscal year 2015—approximately 42 percent of the Department of Energy's (DOE) total fiscal year 2015 budget—to support its mission and related activities.[2]

Since the end of the cold war, key portions of the nuclear security enterprise's weapons production infrastructure have aged and become outdated, prompting congressional and executive branch decision makers to call on DOE to develop plans to modernize the infrastructure.[3] The 2010 *Nuclear Posture Review* (NPR) identified long-term modernization goals and requirements, including sustaining a safe, secure, and effective nuclear arsenal through increasing investments to rebuild and modernize the nation's nuclear infrastructure, among other things.[4] Building on the

[1]NNSA is a separately organized agency within the Department of Energy. It was created under Title 32 of the National Defense Authorization Act for Fiscal Year 2000, Pub. L. No. 106-65, § 3201 et seq.

[2]NNSA's budget did not increase in fiscal year 2013 compared with the previous year due to sequestration, which decreased NNSA's fiscal year 2013 budget by $917 million.

[3]The end of the cold war caused a dramatic shift in how the nation maintains nuclear weapons. Instead of designing, testing, and producing new nuclear weapons, the strategy shifted to maintaining the existing nuclear weapons stockpile indefinitely. Life extension programs extend, through refurbishment, the operational lives of weapons in the nuclear stockpile by 20 to 30 years and certify these weapons' military performance requirements without underground nuclear testing.

[4]Department of Defense, *Nuclear Posture Review Report* (Washington, D.C.: Apr. 6, 2010). The 2010 NPR establishes the nation's nuclear weapons requirements and policy. The president is required to submit a national security strategy annually to the Congress. 50 U.S.C. § 3043 (2015).

2010 NPR, the 2015 National Security Strategy states that the United States must invest the resources necessary to maintain a safe, secure, and effective nuclear deterrent as long as nuclear weapons exist. To meet these goals, NNSA refurbishes weapons in the stockpile to extend their operational lives; replaces or renovates research, development, and production facilities that date back to the 1940s and 1950s; and performs simulations and laboratory experiments to ensure existing nuclear weapons remain safe and reliable. In fiscal year 2011, the administration pledged over $88 billion to NNSA over 10 years for operations and modernization, including the refurbishment of weapons in the current stockpile and construction of facilities to support these refurbishments.

Building from the policy priorities communicated in the *Nuclear Posture Review*, NNSA's *Stockpile Stewardship and Management Plan* (SSMP), which is updated annually, provides information on modernization and operations plans and budget estimates over the next 25 years. The SSMP is NNSA's formal means for communicating to the Congress the status of certain activities and its long-range plans and budget estimates for sustaining the stockpile and modernizing the nuclear security enterprise. The SSMP also discusses the current and projected composition and condition of the nuclear weapons stockpile.

In addition to its defense programs, NNSA implements a range of nonproliferation programs under its Office of Defense Nuclear Nonproliferation (DNN). These programs include efforts to secure, consolidate, and dispose of weapons-usable nuclear materials and radiological sources;[5] reduce the risks of nuclear smuggling; enhance international export controls and International Atomic Energy Agency (IAEA) nuclear safeguards; and support research and development of new nonproliferation technologies.[6]

[5]Weapons-usable nuclear materials are highly enriched uranium, uranium-233, and any plutonium containing less than 80 percent of the isotope plutonium-238. Such materials are also often referred to as fissile materials or strategic special nuclear materials.

[6]IAEA is an independent international organization based in Vienna, Austria, that is affiliated with the United Nations and has the dual mission of promoting the peaceful uses of nuclear energy and verifying that nuclear material subject to safeguards is not diverted to weapons development efforts or other proscribed purposes. Safeguards allow IAEA to independently verify that nuclear material and other specified items are not diverted from peaceful nuclear uses by, among other things, inspecting all facilities and locations containing nuclear material declared by countries to verify its peaceful use.

Our past testimonies in September 2012,[7] March 2013,[8] and July 2013,[9] as well as reports we have issued over the past several years, have highlighted various challenges that NNSA faces in carrying out its mission-related responsibilities.[10] These challenges contribute to our continuing inclusion of NNSA's management of contracts and major projects on our list of agencies and program areas that are at high risk due to their vulnerabilities to fraud, waste, abuse, and mismanagement, or are most in need of transformation. NNSA continues to demonstrate leadership commitment to address these challenges—a key criterion for removal from our high risk list. However, as we reported in our most recent update to the high risk list earlier this year, the agency has not made progress on the other four criteria for removal: organizational capacity, corrective action planning, monitoring effectiveness, and demonstrating progress.[11]

A recent series of external commissions and reports on NNSA's management and structure also speaks to the importance of NNSA's mission and seriousness of these continuing challenges.[12] Notably, the Fiscal Year 2013 National Defense Authorization Act created the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise (Augustine-Mies Panel) to examine options and make recommendations for revising the governance structure, mission, and

[7]GAO, *Modernizing the Nuclear Security Enterprise: Observations on the National Nuclear Security Administration's Oversight of Safety, Security, and Project Management*, GAO-12-912T (Washington, D.C.: Sept. 12, 2012).

[8]GAO, *Modernizing the Nuclear Security Enterprise: Observations on DOE's and NNSA's Efforts to Enhance Oversight of Security, Safety, and Project and Contract Management*, GAO-13-482T (Washington, D.C.: Mar. 13, 2013).

[9]GAO, *Department of Energy: Observations on DOE's Management Challenges and Steps Taken to Address Them,* GAO-13-767T (Washington, D.C.: July 24, 2013).

[10]A list of recent GAO products assessing the Department of Energy's and NNSA's management challenges is included at the end of this statement.

[11]GAO, *High Risk Series: An Update,* GAO-15-290 (Washington, D.C.: Feb. 11, 2015).

[12]Recent commissions include the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise; National Research Council (NRC) Committee on Assessment of the Governance Structure of the NNSA National Security Laboratories; Commission to Review the Effectiveness of the National Energy Laboratories; and Secretary of Energy Advisory Board National Laboratory Task Force.

management of the nuclear security enterprise.[13] This panel issued a report in November 2014.

My testimony today discusses (1) NNSA's plans to modernize the DOE's nuclear security enterprise, (2) NNSA's understanding of the causes of its contract and project management problems, and the extent to which it has implemented our related recommendations, (3) NNSA's DNN progress in securing vulnerable nuclear material and the remaining challenges, and (4) issues that NNSA faces in governance of the nuclear security enterprise. It summarizes key findings from eight reports issued from December 2010 to February 2015. Detailed information about the scope and methodology used to conduct this work can be found in each of our issued reports. The work upon which this statement is based was conducted in accordance with generally accepted government auditing standards.

NNSA Faces Challenges Implementing Its Plans to Modernize the Nuclear Security Enterprise

NNSA manages a complex, decades-long effort to modernize the nuclear security enterprise. In its recent report, the Augustine-Mies Panel observed that NNSA's SSMP, which is intended to communicate long-range plans and cost estimates, has varied from year to year in the costs and schedules for the delivery of several major life extension programs (LEP) and nuclear facilities, and the Panel concluded that the lack of a stable, executable plan for modernization is a fundamental weakness for NNSA. Our 2013 report similarly found that NNSA's SSMP has shown changes in plans and long-term budget estimates from year to year and that some assumptions on future spending estimates may not be realistic. For example, in 2013 we found that:

- The planned schedules for key weapons LEPs had changed. For example, key dates for the W78/88 LEP were pushed several years into the future. Specifically, this program shifted from a 2021 first-

[13]Mr. Norman R. Augustine and Admiral Richard W. Mies served as the Co-Chairmen of the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise. Section 3166 of the Fiscal Year 2013 National Defense Authorization Act establishes the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise and tasks the advisory panel to offer recommendations "…with respect to the most appropriate governance structure, mission, and management of the nuclear security enterprise." The panel's report summarizes the panel's findings on the current health of the enterprise, examines the root causes of its governance challenges, and offers its recommendations to address the identified problems.

production-unit and 2031 completion time frame in the fiscal year 2012 SSMP to a 2025 first-production-unit and 2036 completion time frame in the fiscal year 2014 SSMP.[14] We have ongoing work looking at the fiscal year 2015 SSMP.

- NNSA's long-term budget estimates for the nuclear security enterprise have continued to change from year to year.[15] For example, we found that NNSA's stockpile budget estimates from 2014 through 2031 increased by about $27 billion compared with the 2012 stockpile budget estimates for the same time period.[16] We noted that some of these changes were due to decisions made by the Nuclear Weapons Council.[17] For example, according to the 2014 SSMP, the Nuclear Weapons Council directed changes to the planned schedules for some of the LEPs to accommodate the number and scope of all LEPs, which contributed to increases in the stockpile budget estimates.[18]

[14]The "first production unit" is the first complete warhead from a production line certified for deployment.

[15]GAO, *Modernizing the Nuclear Security Enterprise: NNSA's Budget Estimates Do Not Fully Align with Plans,* GAO-14-45 (Washington, D.C.: Dec. 11, 2013). The National Defense Authorization Act for Fiscal Year 2011 mandated that GAO study and report annually on whether NNSA's nuclear security budget materials provide for funding that is sufficient to modernize and refurbish the nuclear security enterprise as well as recapitalize its infrastructure. Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Pub. L. No. 111-383, § 3113, 124 Stat. 4137, 4509, *amended by* National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239, § 3132(a)(2), 126 Stat. 1632, 2185.

[16]GAO-14-45. These budget estimates include the SSMP, the Future-Years Nuclear Security Program (FYNSP), and NNSA's annual justification of the President's budget request, which typically includes the FYNSP.

[17]Nuclear Weapons Council is a joint organization composed of representatives from DOD and DOE that facilitates high-level coordination to secure, maintain, and sustain the nuclear weapons stockpile.

[18]LEPs extend, through refurbishment, the operational lives of weapons in the nuclear stockpile by 20 to 30 years and certify these weapons' military performance requirements without underground nuclear testing. In addition to LEPs, stockpile costs include those for other major weapons alterations and modifications; surveillance efforts to evaluate the condition, safety, and reliability of stockpiled weapons; maintenance efforts to perform certain minor weapons alterations or to replace components that have limited lifetimes; and core activities to support these efforts.

- NNSA had not included estimated costs to construct both the Uranium Processing Facility (UPF) and the Chemistry Metallurgy Replacement Facility (CMRR). We recommended that NNSA include in its estimates at least a range of budget estimates for known future expenses for large capital projects even when a fully developed cost estimate had not been developed. NNSA agreed with this recommendation and the 2015 SSMP included estimates for these major large capital projects, which had previously been excluded. In addition, in the 2014 SSMP, NNSA also changed its methodology for developing budget estimates for LEPs. For example, NNSA officials said that the 2012 budget estimates for LEPs were based on an older LEP because there was not enough data at that time from recent and ongoing LEPs to develop cost models.[19] In contrast, NNSA officials told us that they based their 2014 estimates on more reliable data from an ongoing LEP.

Our 2013 report also found that some assumptions in the SSMP may be unrealistic. NNSA's budget estimates to operate and maintain its existing facilities and infrastructure remain relatively flat through 2031 at about $1.5 billion per year (in constant dollars). However, much of NNSA's existing facilities and infrastructure were constructed more than 50 years ago and are reaching the end of their useful lives. As a result, the agency is undertaking a number of improvement projects to modernize and maintain these facilities. We concluded that it may not be realistic for NNSA to assume that its annual budget estimates for operations and maintenance of facilities from 2014 to 2031 can remain relatively flat when its aging facilities will likely need additional resources to maintain them in the future.

[19]NNSA officials used data from the Reliable Replacement Warhead, a program that sought to develop a modern replacement warhead. This program was cancelled in 2009.

NNSA Does Not Fully Understand the Causes of Its Contract and Project Management Problems and Appears Resistant to Implementing GAO's Recommendations

In our February 2015 update to our high risk list, we expressed concern that DOE, including NNSA, may not have adequately identified the root causes of its contract and project management challenges. Our update also found that NNSA appeared resistant to implementing some of the recommendations we made in 2014 to correct these problems.

NNSA's Continued Corrective Actions Suggest It Does Not Understand the Causes of Its Contract and Project Management Problems

DOE has undertaken numerous efforts over the years to understand and address its contract and project management challenges. Our 2015 high risk update described a sequence of actions starting in 2008, when DOE issued a root cause analysis and a corrective action plan that identified what DOE considered to be the 10 most significant issues in managing its contracts and projects, and the actions needed to mitigate these issues. These issues included problems with front-end planning, project funding, accountability, cost estimating, contract and project management workforce, and project oversight.[20] DOE issued another report in 2011 that stated that the corrective actions it implemented from its 2008 plan had effectively mitigated most of the root causes of these issues.[21] However, the department continued to identify additional root causes and corrective actions and recommendations to address its persistent contract and project management challenges. In 2010, DOE identified in a report six additional barriers to improving contract and project management and developed corrective actions to address these barriers.[22] In 2012, DOE issued another report stating that it had completed or partially completed

[20] *U.S. Department of Energy, Root Cause Analysis: Contract and Project Management* (Washington, D.C.: April 2008); U.S. Department of Energy, *Root Cause Analysis: Contract and Project Management Corrective Action Plan* (Washington, D.C.: July 2008).

[21] *U.S. Department of Energy, Root Cause Analysis and Corrective Action Plan Closure Report* (Washington, D.C.: February 2011).

[22] *U.S. Department of Energy, U.S. Department of Energy: Contract and Project Management Improvement* (Washington, D.C.: April 2012).

the corrective actions necessary to address these barriers.[23] In November 2014, DOE issued another report on project management that identified four key factors that contribute to project management success or failure at DOE: front-end planning, project funding, accountability, and project oversight.[24] The report also included 21 recommendations to address continuing project management challenges. Notably, all four of these factors are among those discussed in DOE's 2008 root cause analyses and among those that DOE said in 2011 it had at least partially mitigated. As we noted in our February 2015 update to our high risk list,[25] DOE's long history of identifying additional corrective actions suggests that it has not always fully understood the causes of its contract and project management problems.

More importantly, DOE's December 2014 project management report included a description of actions to address the four key factors it had identified; however it did not discuss why the previous attempts to address these issues had either failed or why these problems had reemerged. For example, the 2008 corrective action plan found front-end planning as one of the top 10 issues contributing to the department's contract and project management problems. The corrective actions DOE identified in that report included developing a more detailed internal front-end planning process, such as identifying and defining specific assumptions for technical design and nuclear safety requirements. However, this is contrary to DOE's 2011 report that stated that the department had fully or partially completed all corrective measures from 2008, including those related to front-end planning. In addition, the 2008 report identified a number of areas where DOE had continuing challenges, including cost estimating and an inadequate number of federal contracting and project management personnel. For cost estimating, our November 2014 report also found that DOE and NNSA cost estimating requirements and guidance for projects and programs

[23] *U.S. Department of Energy, U.S. Department of Energy: Contract and Project Management Improvement Closure Plan.* (Washington, D.C.: April 2012).

[24] *U.S. Department of Energy, Improving Project Management: Report of the Contract and Project Management Working Group* (Washington, D.C.: November 2014).

[25] GAO-15-290.

generally did not reflect best practices for developing cost estimates.[26] For federal personnel, our February 2015 high risk report found that DOE did not meet the criteria for having the capacity (people and resources) to resolve contract and project management problems.[27] Our report cited a DOE workforce analysis from 2013 that concluded that DOE had an extremely low number of contract specialists. We also noted in our report that this workforce analysis did not include the other key staff members normally included in the description of the acquisition workforce, such as program and project managers and contracting officer representatives.[28] In contrast to these findings, DOE reported, in 2011, that it would complete its efforts to improve cost estimating later that year, and that had substantially completed its efforts to enhance the federal contract and project management workforce.

DOE Appears Resistant to Implementing Recommendations Intended to Improve DOE Project Management Problems

We have previously noted instances where DOE appeared resistant to implementing some of our recommendations to correct DOE's project management problems. For example, our February 2014 report included an evaluation of NNSA's mixed oxide (MOX) fuel fabrication facility, the estimated cost of which NNSA had increased by more than $6.3 billion from NNSA's initial estimate in 1997 to about $7.7 billion in 2014.[29] In that report, we recommended that DOE require a root cause analysis for projects that experience cost increases or schedule delays exceeding a certain threshold established by the department, including the MOX facility. We noted that such an analysis would help ensure that future

[26]GAO, *Project and Program Management: DOE Needs to Revise Requirements and Guidance for Cost Estimating and Related Reviews,* GAO-15-29 (Washington, D.C.: Nov. 25, 2014). We reported in 2014 on efforts by DOE, including NNSA, to improve its cost estimating efforts. For example, at that time, DOE had embarked on a Cost Estimating and Scheduling Initiative to systematically improve DOE's policies and guidance. In addition, in April 2013, NNSA created the Office of Program Review and Analysis. According to NNSA, this office is intended to improve NNSA's ability to plan and budget by providing senior leadership independent advice on resource allocations to ensure the best use of the agency's resources, including evaluating cost estimates of NNSA projects and programs.

[27]GAO-15-290

[28]GAO-15-290

[29]GAO, *Plutonium Disposition Program: DOE Needs to Analyze the Root Causes of Cost Increases and Develop Better Cost Estimates,* GAO-14-231 (Washington, D.C.: Feb. 13, 2014).

DOE projects benefit from lessons learned that reflect the causes of past projects' cost increases and schedule delays. DOE disagreed with our recommendation, stating that such an analysis should not be required, and that DOE program offices could decide on a case-by-case basis when to conduct such an analysis. However, DOE's requirements do not define how or when a root cause analysis should be conducted and it is not clear when or what would trigger a root cause analysis, which could result in analyses not being conducted consistently or not being conducted at all, hampering DOE's ability to apply lessons learned from past projects to ongoing or future projects. We continue to believe that a root cause analysis should be conducted for all projects that experience cost increases or schedule delays above a threshold established by the department. We also note that our recommendation is consistent with a requirement in the Weapon Systems Acquisition Reform Act of 2009, under which that the Department of Defense must perform a root cause analysis of a cost increase that exceeds a certain threshold.

Similarly, in 2014, we issued two reports with recommendations addressing key elements of the front-end planning process for large projects and programs. In both reports, DOE agreed with the recommendations, but it did not indicate whether it would implement them. In November 2014, we noted that DOE had a history of struggling to complete many of its major construction projects within initial cost and schedule estimates.[30] We found that DOE and NNSA cost estimating requirements and guidance for projects and programs generally do not reflect best practices for developing cost estimates. We also found in November 2014 that, because DOE and NNSA do not require reviews of program cost estimates, the extent of weaknesses in program cost estimates is largely unknown. DOE itself, in 2008, identified inadequate cost estimating capability as one of the top 10 most significant issues contributing to its contract and project management challenges. To address these issues, we recommended that DOE, among other things, revise its requirements and guidance for projects and programs to ensure DOE and NNSA and its contractors develop cost estimates in accordance with cost estimating best practices, and that independent reviews of programs are conducted periodically. DOE agreed with these recommendations. However, DOE did not specify a timeline for

[30]GAO-15-29.

implementing many of these recommendations, indicating to us DOE's lack of urgency or commitment in correcting these issues.

In the second report, issued in December 2014, we examined how DOE selects approaches for its projects to meet mission requirements.[31] In this report, we found that several of DOE's major construction projects, including some of NNSA's, had incurred significant cost increases and schedule delays, and that DOE was in the process of reassessing the originally selected project alternative for each project. We found that neither DOE's requirements nor its guidance for analyzing alternatives conformed to best practices, and therefore DOE could not have confidence that applying its requirements and guidance would lead to a reliable analysis. A reliable analysis is critical to ensuring that key capital asset and program decisions will both meet mission needs and be cost-effective. To address these issues, we recommended that DOE incorporate all best practices into its analysis-of-alternatives requirements. DOE agreed with this recommendation, but again, it did not specify a timeline for implementing the recommendation, indicating to us a lack of urgency and commitment to correct the problem.

NNSA's DNN Programs Have Made Some Progress Securing Vulnerable Nuclear Material, but Significant Challenges Remain

Our reports have found that DNN has made some progress in securing vulnerable nuclear material. Specifically, we reported in December 2010 on NNSA's efforts to carry out the President's April 2009 initiative (also known as the Prague initiative) calling on the agency to secure all vulnerable nuclear material around the world within 4 years.[32] In that report, we found that NNSA's Materials Protection, Control and Accounting Program had made considerable progress securing Russian nuclear warheads and materials at numerous Russian sites. The president's 2009 Prague initiative ended in December 2013, but DNN and the U.S. government's commitment to ensuring the security of worldwide nuclear materials endures, and we have ongoing work examining it.

[31]GAO, *DOE and NNSA Project Management: Analysis of Alternatives Could Be Improved by Incorporating Best Practices,* GAO-15-37, (Washington, D.C.: Dec. 11, 2014).

[32]GAO, *Nuclear Nonproliferation: Comprehensive U.S. Planning and Better Foreign Cooperation Needed to Secure Vulnerable Nuclear Materials Worldwide,* GAO-11-227 (Washington, D.C.: Dec. 15, 2010).

However, our reports have also identified key challenges NNSA faces in its efforts to secure vulnerable nuclear materials. In our December 2010 report, we found that NNSA had estimated it would assist Russia in consolidating its HEU to fewer, more secure locations by removing material from five sites and 50 buildings completely by 2010; however, it had achieved removal of all highly enriched uranium (HEU) from only one site and 25 buildings. In addition, we found that NNSA had made little progress in converting research reactors in Russia from the use of HEU. At that time, NNSA planned to complete the conversion or verify the shutdown of 71 HEU-fueled research reactors and related facilities in Russia by 2020; however, Russia had not agreed to convert any of these facilities. Nonetheless, Russia verified to NNSA in February 2010 that it had shut down three of its research reactors, and NNSA achieved an agreement in principle to conduct conversion feasibility studies on six additional Russian research reactors.

In addition, in September 2011, we found that DNN and U.S. agencies faced significant challenges in accounting for and ensuring the security of U.S. weapons-usable nuclear materials as a result of foreign nuclear research and commercial power activities.[33] That report found that, of 55 visits by U.S. physical protection teams to overseas sites from 1994 through 2010, partner countries met international physical security guidelines about half the time.

Moreover, we identified weaknesses in DNN's and other U.S. agencies' management of this effort. Among other concerns, we found in September 2011 that DNN's and U.S. agencies' activities for prioritizing and coordinating physical protection visits and measuring performance did not meet GAO's best practices for agency performance or DOE's standards for internal control.[34] Specifically, we found that DNN and U.S. agencies had not systematically visited countries believed to be holding the highest proliferation risk quantities of U.S. nuclear material. DNN and U.S. agencies had not systematically revisited sites that did not meet physical security guidelines in a timely manner, and NNSA and U.S. agencies did not have a comprehensive, current inventory of U.S.

[33]GAO, *Nuclear Nonproliferation: U.S. Agencies Have Limited Ability to Account for, Monitor, and Evaluate the Security of U.S. Nuclear Material Overseas*, GAO-11-920 (Washington, D.C.: Sept. 8, 2011).

[34]GAO-11-920.

weapons usable nuclear materials overseas. We suggested that the Congress consider directing NNSA and the Nuclear Regulatory Commission to compile an inventory of U.S. HEU and separated plutonium overseas. We also recommended that NNSA develop a more systematic process for identifying and prioritizing future physical protection visits, and periodically review performance toward meeting goals for the U.S. physical protection program visits. NNSA disagreed with our recommendations. However, it has taken some actions to address them including compiling an initial inventory of U.S.-origin HEU overseas and developing a more systematic process for identifying and prioritizing future protection visits.

We have also identified challenges in another element of DNN's mission—improving the capabilities of other countries to detect, deter and interdict smuggled nuclear material. The Second Line of Defense program—including the Megaports Initiative, which was consolidated into Second Line of Defense in 2014—is essential to this effort. [35] In October 2012,[36] we issued a report examining the Megaports Initiative and found that the continuity and sustainability of the Megaports program could be a concern going forward. We found that NNSA had not finalized a long-term plan for ensuring the sustainability of the Megaports Initiative and recommended that NNSA finalize a sustainability plan for ensuring ongoing operations after NNSA transfers all equipment, maintenance, operations, and related financial responsibilities to partner countries. We also found that the initiative's performance measures did not provide sufficient information for decision making because they did not evaluate the program's impact and effectiveness. We recommended that NNSA develop and maintain useful and reliable measures to assess the performance of the initiative. NNSA agreed with our recommendations and, in fiscal year 2014, added a new metric that tracks the cumulative number of sites that are being maintained by the host country.

[35]The Second Line of Defense—now called the Nuclear Smuggling Detection and Deterrence (NSDD) program— was designed to deter, detect, and interdict illicit trafficking of nuclear materials by installing radiation detection equipment at border crossings, airports, and seaports of partner countries. The Megaports Initiative funded the installation of radiation detection equipment at select seaports overseas and trained foreign personnel to use this equipment to scan shipping containers entering and leaving these seaports.

[36]GAO, *Combating Nuclear Smuggling: Megaports Initiative Faces Funding and Sustainability Challenges,* GAO-13-37 (Washington, D.C.: Oct. 31, 2012).

Finally, the effectiveness of NNSA's nuclear nonproliferation mission depends in part on the agency's plutonium disposition program, and we found in 2014 NNSA faces challenges in this regard.[37] The plutonium disposition program has represented a significant portion of the DNN budget over the past 5 years, ranging from approximately 18 percent of the DNN budget request in fiscal year 2015 to approximately 36 percent of the DNN budget request in fiscal year 2013. This program is a key element of the U.S. commitment to dispose of 34 metric tons of weapons grade surplus plutonium under the Plutonium Management and Disposition Agreement between the United States and Russia. The construction of the MOX facility at DOE's Savannah River Site in South Carolina has been the central focus in meeting this commitment. In February 2015, we reported on several challenges in this program, including a cost increase of approximately $2.9 billion and a schedule delay of about 3 years, and DOE generally agreed with our recommendations to address these issues.[38] DOE is continuing to construct the MOX facility and is conducting additional analyses of the project, including independent cost and schedule estimates as well as an analysis of alternatives approaches for plutonium disposition.

NNSA recently reorganized its DNN programs into a new structure, and for several years has sustained an effort to assess "over the horizon" nuclear and radiological proliferation threats and trends—in other words, evolving threats over the next decade.[39] However, according to NNSA officials, the Russian government recently decided to cease joint cooperation with NNSA at most Russian weapons complex and civilian nuclear sites as of December 2014, which presents new challenges for NNSA and raises questions about the status of projects not yet completed and the sustainability of progress already made. We will continue to follow these issues and have ongoing work looking at NNSA's nonproliferation programs, including planning, management, and their effectiveness.

[37]GAO-14-231.

[38]GAO-15-290.

[39]DNN now manages the following programs: Material Management and Minimization, Global Material Security, Nonproliferation and Arms Control, Nonproliferation Construction, and Defense Nuclear Nonproliferation Research & Development.

NNSA Faces Challenges in Its Governance of the Nuclear Security Enterprise

The Augustine-Mies's Panel's report highlighted the challenges NNSA faces in its governance of the nuclear security enterprise.[40] The issues and concerns identified in this report appear to be consistent with those that we have previously described in our work.

Regarding NNSA's modernization efforts, the Augustine-Mies Panel observed that the 2015 SSMP assumes a budget that may not be achievable and that NNSA's nuclear modernization plans are significantly underfunded relative to identified needs. The panel further noted that the SSMP reflected significant delays in the delivery of several major LEPs and nuclear facilities, and that the lack of a stable, executable plan for modernization is a fundamental weakness for NNSA. As noted earlier, our work has found that NNSA's long-term budget estimates for the nuclear security enterprise have continued to change from year to year and that some assumptions in the SSMP may be unrealistic.

In addition, consistent with our 2015 high risk update, the Augustine-Mies Panel found that NNSA's capital projects have been a continuing source of cost overruns and schedule delays. The panel noted that these have significantly undermined the agency's credibility and recommended that DOE strengthen its efforts to develop independent cost and resource analysis capabilities and that leadership employ a rigorous analysis of alternatives early in the decision process as the basis for assessing and validating program requirements. The panel also recommended holding managers accountable for implementing the department's directive on project management (Order 413.3B). The panel noted that while adherence to DOE orders is mandatory, in practice, Order 413.3B has been viewed more as guidance that is not always followed, and that stricter enforcement is necessary. In addition, the Augustine-Mies Panel found specific shortfalls in critical skills for program management, cost estimation, and resource management and recommended that NNSA leadership analyze the level and skill mix of the workforce necessary to meet future needs and invest in the needed skills in the workforce. Our high risk update noted that DOE, including NNSA, did not have the capacity (people and resources) to resolve contract and project management problems. We reported that DOE, including NNSA, had taken some actions to address capacity issues, but these actions have

[40]Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise, *A New Foundation for the Nuclear Security Enterprise*; November 2014.

not yet ensured that the department has the capacity to fully address its contract and project management challenges.

On implementation of corrective actions plans, the panel noted that there have been numerous previous studies with numerous valid recommendations, many of which recurred in the panel's assessment as well. The panel noted, however, that there was not a well-established process for reviewing these recommendations, performing root cause analysis of them, taking corrective action where appropriate, and then following up to ensure that the corrective actions are institutionalized. The panel recommended that nuclear security enterprise leadership develop a process to provide accountability and follow up on findings and recommendations from studies and reviews, both internal and external. In December 2014, the Secretary issued a memo stating that DOE would strengthen the role of the Energy Systems Acquisition Advisory Board and establish a project management risk committee to provide agency-wide project management risk assessment and expert advice. As we noted in our 2015 high risk update, this initiative demonstrates the continued commitment of top leadership to address its contract and project management challenges, but DOE's cycle of identifying root causes, recommendations and corrective actions—which DOE declares successful, only to later issue another set of root causes and corrective actions—raises concerns that DOE has not fully identified the root causes behind these problems.

The panel also examined NNSA's oversight of its management and operating (M&O) contractors and raised questions regarding the impact and effectiveness of contract requirements and performance metrics on mission execution. We have ongoing work examining NNSA's contract oversight policies and guidance that examines NNSA's approach to overseeing and evaluating its M&O contractors and how NNSA determines the extent to which it can use contractor assurance systems for deciding M&O contractor award fees.[41] This report is expected to be completed in May 2015.

[41]Contractor assurance systems are management systems and processes designed and used by NNSA's contractors to monitor their own performance and self-identify and correct potential problems. NNSA, which validates the systems, used the systems' data to monitor contractors' performance in safety, security, and other areas and to tailor the level of oversight.

Chairman Sessions, Ranking Member Donnelly, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff members have any questions about this testimony, please contact me at (202) 512-3841 or trimbled@gao.gov. Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this statement. GAO staff who made key contributions to this testimony are Nathan Anderson, Assistant Director; Allison Bawden; Alisa Beyninson; Antoinette Capaccio; Daniel Feehan; Jonathan Gill; Bridget Grimes; William Hoehn; Amanda Kolling; Michelle Munn; Alison O'Neill; and Rebecca Shea.

Selected Recent GAO Products Assessing the Department of Energy's and National Nuclear Security Administration's Management Efforts

The following is a selection of GAO's recent work assessing the Department of Energy's and National Nuclear Security Administration's management efforts:

High-Risk Series: An Update. GAO-15-290. Washington, D.C.: February 11, 2015.

DOE and NNSA Project Management: Analysis of Alternatives Could Be Improved by Incorporating Best Practices GAO-15-37. Washington, D.C.: December 11, 2014.

Project and Program Management: DOE Needs to Revise Requirements and Guidance for Cost Estimating and Related Reviews. GAO-15-29. Washington, D.C.: November 25, 2014.

Nuclear Weapons: Some Actions Have Been Taken to Address Challenges with the Uranium Processing Facility Design. GAO-15-126. Washington, D.C.: October 10, 2014.

Plutonium Disposition Program: DOE Needs to Analyze the Root Causes of Cost Increases and Develop Better Cost Estimate. GAO-14-231.Washington, D.C.: February 13, 2014.

Modernizing the Nuclear Security Enterprise: NNSA's Budget Estimates Do Not Fully Align with Plans. GAO-14-45. Washington, D.C.: December 11, 2013.

Modernizing the Nuclear Security Enterprise: Observations on NNSA's Options for Meeting Its Plutonium Research Needs. GAO-13-533. Washington, D.C.: September 11, 2013.

Department of Energy: Observations on DOE's Management Challenges and Steps Taken to Address Them. GAO-13-767T. Washington, D.C.: July 24, 2013.

National Nuclear Security Administration: Laboratories' Indirect Cost Management Has Improved, but Additional Opportunities Exist. GAO-13-534. Washington, D.C.: June 28, 2013.

Nuclear Nonproliferation: IAEA Has Made Progress in Implementing Critical Programs but Continues to Face Challenges. GAO-13-139. Washington, D.C.: May 16, 2013.

Department of Energy: Observations on Project and Program Cost Estimating in NNSA and the Office of Environmental Management. GAO-13-510T. Washington, D.C.: May 8, 2013.

Modernizing the Nuclear Security Enterprise: Observations on DOE's and NNSA's Efforts to Enhance Oversight of Security, Safety, and Project and Contract Management. GAO-13-482T. Washington, D.C.: March 13, 2013.

High-Risk Series: An Update. GAO-13-283. Washington, D.C.: February 2013.

Department of Energy: Better Information Needed to Determine If Nonmajor Projects Meet Performance Targets. GAO-13-129. Washington, D.C.: December19, 2012.

Combating Nuclear Smuggling: Megaports Initiative Faces Funding and Sustainability Challenges. GAO-13-37. Washington, D.C.: October 31, 2012.

Modernizing the Nuclear Security Enterprise: Observations on the National Nuclear Security Administration's Oversight of Safety, Security, and Project Management. GAO-12-912T. Washington, D.C.: September 12, 2012.

Modernizing the Nuclear Security Enterprise: Observations on the Organization and Management of the National Nuclear Security Administration. GAO-12-867T. Washington, D.C.: June 27, 2012.

Modernizing the Nuclear Security Enterprise: NNSA's Reviews of Budget Estimates and Decisions on Resource Trade-offs Need Strengthening. GAO-12-806. Washington, D.C.: July 31, 2012.

Modernizing the Nuclear Security Enterprise: Strategies and Challenges in Sustaining Critical Skills in Federal and Contractor Workforces. GAO-12-468. Washington, D.C.: April 26, 2012.

Modernizing the Nuclear Security Enterprise: New Plutonium Research Facility at Los Alamos May Not Meet All Mission Needs. GAO-12-337. Washington, D.C.: March 26, 2012.

Nuclear Weapons: NNSA Needs to Improve Guidance on Weapon Limitations and Planning for Its Stockpile Surveillance Program. GAO-12-188. Washington, D.C.: February 8, 2012.

Department of Energy: Additional Opportunities Exist to Streamline Support Functions at NNSA and Office of Science Sites. GAO-12-255. Washington, D.C.: January 31, 2012.

Nuclear Nonproliferation: Action Needed to Address NNSA's Program Management and Coordination Challenges. GAO-12-71. Washington, D.C.: December 14, 2011.

High-Risk Series: An Update. GAO-11-278. Washington, D.C.: February 2011.

Nuclear Nonproliferation: U.S. Agencies Have Limited Ability to Account for, Monitor, and Evaluate the Security of U.S. Nuclear Material Overseas. GAO-11-920. Washington, D.C.: September 8, 2011.

Nuclear Nonproliferation: Comprehensive U.S. Planning and Better Foreign Cooperation Needed to Secure Vulnerable Nuclear Materials Worldwide. GAO-11-227. Washington, D.C.: December 15, 2010.

Nuclear Weapons: National Nuclear Security Administration's Plans for Its Uranium Processing Facility Should Better Reflect Funding Estimates and Technology Readiness. GAO-11-103. Washington, D.C.: November 19, 2010.

Nuclear Nonproliferation: National Nuclear Security Administration Has Improved the Security of Reactors in its Global Research Reactor Program, but Action Is Needed to Address Remaining Concerns. GAO-09-949. Washington, D.C.: September 17, 2009.

Nuclear Weapons: Actions Needed to Identify Total Costs of Weapons Complex Infrastructure and Research and Production Capabilities. GAO-10-582. Washington, D.C.: June 21, 2010.

Nuclear Nonproliferation: DOE Needs to Address Uncertainties with and Strengthen Independent Safety Oversight of Its Plutonium Disposition Program. GAO-10-378. Washington, D.C.: March 26, 2010.

Nuclear Security: Better Oversight Needed to Ensure That Security Improvements at Lawrence Livermore National Laboratory Are Fully

Implemented and Sustained. GAO-09-321. Washington, D.C.: March 16, 2009.

Nuclear Weapons: NNSA and DOD Need to More Effectively Manage the Stockpile Life Extension Program. GAO-09-385. Washington, D.C.: March 2, 2009.

Nuclear Nonproliferation: DOE's Program to Assist Weapons Scientists in Russia and Other Countries Needs to Be Reassessed. GAO-08-189. Washington, D.C.: December 12, 2007.

Nuclear and Worker Safety: Actions Needed to Determine the Effectiveness of Safety Improvement Efforts at NNSA's Weapons Laboratories. GAO-08-73. Washington, D.C.: October 31, 2007.

Securing U.S. Nuclear Material: DOE Has Made Little Progress Consolidating and Disposing of Special Nuclear Material. GAO-08-72. Washington, D.C.: October 4, 2007.

Nuclear Nonproliferation: Progress Made in Improving Security at Russian Nuclear Sites, but the Long-term Sustainability of U.S.-Funded Security Upgrades Is Uncertain. GAO-07-404. Washington, D.C.: February 28, 2007.

National Nuclear Security Administration: Additional Actions Needed to Improve Management of the Nation's Nuclear Programs. GAO-07-36. Washington, D.C.: January 19, 2007.

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Senator SESSIONS. Thank you.

Yes, Senator King?

Senator KING. Mr. Chairman, I apologize. I want to apologize to the witnesses. I have an unusual Wednesday afternoon Intelligence meeting on overhead architecture which is also related to this, and I have to excuse myself. But we will be submitting questions for the record.

Senator SESSIONS. Thank you. And if you would like to ask a few questions before you leave——

Senator KING. No. That is all right. I will submit the questions for the record.

Thank you all very much and thanks for the work that you do. Senator Fischer and I had the opportunity to visit two of the labs, and Dr. Klotz, it was very impressive what the people are doing out there. I commend to you gentlemen a visit to those labs in New Mexico. Where are they? They are in New Mexico.

[Laughter.]

So I follow with interest what you are doing and apologize for having to absent myself. The Intelligence Committee very rarely meets on a Wednesday, but this is an important issue. So thank you.

Senator SESSIONS. Thank you, Senator King. And thanks for your faithful attendance and interest in this subcommittee.

So, General Klotz, let me just sort of ask you quickly a serious of questions about projects that are ongoing that we need to keep on track at cost and schedule. My overall question is I believe it would be appropriate and necessary for you to let us know if there are problems in these areas that you know are going to be there or may be there. So give us a heads-up warning. So can you give us a quick update on the life extension programs in general? Dr. Cook, you contribute to this as you all agree. Are they on schedule? Are we having any cost overruns? Are they synchronized with the respective DOD delivery systems? Can you give us insight into that and how are we doing?

Dr. KLOTZ. Yes, sir, I can. And I would welcome Dr. Cook, who has——

Senator SESSIONS. I have about six of these I am going to ask. I would kind of like to just be on the record if you see a problem, and then maybe we can pursue that after we run the list to kind of give us a perspective of where we are.

So let me start this way then. The W76–1, submarine-launched ballistic missile warhead. In production, it was expected to be complete by the end of 2019. How are we doing on that?

Dr. KLOTZ. W76–1 is currently in the production phase. This past year, 2014, we past the halfway point. Everything is on track for completing the program in fiscal year 2019.

Dr. COOK. It is meeting its full cost, schedule, and scope objectives, right now on track.

Senator SESSIONS. Good.

What about the B61–12, the tactical strategic bomb?

Dr. KLOTZ. The B61–12 is in engineering development or development engineering. We had a very good year last year in terms of the initial tests and in terms of the funding, and it is on track to deliver the first production unit in 2020.

Dr. COOK. Additionally, it is now in its fourth full year of full-scale engineering development and again meeting all cost, schedule, and scope milestones.

Senator SESSIONS. Good.

The W88 alternate 370, the submarine-launched ballistic missile warhead.

Dr. KLOTZ. Senator, this is one of the significant changes in this year's budget submission. We had originally intended to do an alteration to the W88 affecting its arming, fusing, and firing assembly, as well as some other limited life component changes to the warhead. Based upon ongoing surveillance conducted by our lab-

oratories and our plants, we detected an aging issue, and it made sense to us and to the United States Navy that when we bring these warheads back for this alteration, that we also change out the conventional high explosive, which is one of the components within the warhead. So that has required a cost increase in this year's budget submission. Yet we are still on track for doing the alteration and having the first production unit available in fiscal year 2020.

Dr. COOK. This one is in its third year of full-scale engineering development, and as Under Secretary Klotz said, we are adding new scope that results in new cost. But all of the existing scope is meeting cost and schedule requirements.

Senator SESSIONS. Well, tell me about what do you expect—my understanding from previous discussions with General Klotz, this is a necessary thing. It is an appropriate, wise decision to do the explosive replacement at the same time. What kind of cost are we looking at? Is that in the budget?

Dr. COOK. The cost estimate that we have for the whole refresh of the explosive is $530 million. We have expended about $30 million of that if you look through last year and you project this year to the end. It is in the budget. We have worked thoroughly with DOD and with U.S. Strategic Command [STRATCOM], and we have decided to cut out some other parts of the budget giving this higher priority, not requesting additional money.

Dr. KLOTZ. Senator, if I could just stress, though, the W88 warhead is a safe, secure, and effective warhead. This is the reason why we have a scientifically based stockpile stewardship program. We surveil these systems as they age, and we are trying to prudently head off a problem down the road while we are doing the already scheduled work on the W88. This decision was endorsed by the Nuclear Weapons Council and by the Navy. So we are going forward as a joint team on this.

Senator SESSIONS. Good.

And one more and I will go to Senator Donnelly. The W80–4, the air-launched cruise missile warhead.

Dr. KLOTZ. Another change, Senator, to our budget submission this year. In the last year's budget submission, we had forecasted providing the first production unit in fiscal year 2027. That is how the budget was built. Again, because of discussions with DOD and STRATCOM and the Air Force over its requirements for a follow-on to the air-launched cruise missile, a system that has been in the Air Force for decades now, they wanted to deliver that capability earlier, and so we have moved up the delivery of the first production unit from 2027 to 2025 with this budget request. And again, the additional cost for that acceleration is covered within our budget submission.

Dr. COOK. This W80 Mod 4, as it is now called, is in the first phase 6–1, where we get the requirements right. We lay out the approaches to be taken. We are doing that analysis. We will conclude that work by June of this year, so just a couple of months. And then we will begin the phase 6–2. Again, it is meeting cost, scope, and schedule requirements and is strongly joined by the Air Force, STRATCOM, and NNSA. And given a down-selection to the

W80 family made by Nuke Weapons Council last year, that is progressing well.

Senator SESSIONS. Good.

Senator Donnelly?

Senator DONNELLY. Thank you, Mr. Chairman.

Administrator Klotz, in regards to the cost analysis and program evaluation office that was created in the NDAA [National Defense Authorization Act] for Fiscal Year 2014, are you still fully committed to filling that out?

Dr. KLOTZ. Yes, Senator Donnelly, we are. We have worked very closely with the DOD Cost Assessment and Program Evaluation (CAPE) organization in putting together a staffing plan, as well as a training plan to have a similar capability within NNSA. We formally chartered that in September of this past year, and we are beginning to build out the number of people in the organization. We ultimately expect to have 18 people, Federal employees, in the organization by 2017, and nine people by the end of this year. We currently stand at seven Federal officials in the office.

Senator DONNELLY. Well, that kind of leads into last year we upped the number of personnel to 1,690 positions. I was wondering what your long-term projections are for personnel, as well as the skill mix that you see.

Dr. KLOTZ. Well, first of all, Senator, I would like to actually thank this committee for their help and assistance in preventing the cap which was set at 1,690 last year from being even lower than we feared it might by in the fiscal year 2015 legislative cycle.

NNSA staff has decreased by 10.4 percent since 2012. Yet at the same time, the scope and scale of our work has greatly expanded. As Senator Sessions just led us through, we have four ongoing life extension programs. We have three major capital construction projects. Yet the NNSA manpower to oversee this work and to look out for the Government and the taxpayers? interest is decreasing.

By the way, this is not the way in which DOD does work. For instance, in the B61–12 life extension program, NNSA's responsibility for that joint program is $8.1 billion, and the Air Force is $1.6 billion. But to do our work, we have 20 people for $8.1 billion, whereas the Air Force has 93 Federal officials and contractors for $1.6 billion. So our people are stretched. We are asking them to do a lot. So the 1,690 cap—we would hate to see that go any lower this year. In fact, we would actually like to see it lifted a bit.

Senator DONNELLY. Ms. Harrington, the NNSA is a world leader in emergency response to nuclear incidents. What are we doing to help build capacity around the world so other countries can deal with the same kind of events that we are training for constantly?

Ms. HARRINGTON. Thank you for that question.

The international emergency response programs have leveraged what we do here domestically in emergency response. Our International Emergency Response Cooperation (IEMC) program, has adapted our domestic emergency training programs and other capacity-building programs, including development of plans and procedures, drills. Particularly important are the exercises. We help other countries organize and other assistance as requested worldwide.

We use the same personnel for these international programs and to train people internationally that we use here in the United States to do the same thing. So we take the best of the best. And most importantly, we are working with the International Atomic Energy Agency to help build their capacity.

Senator DONNELLY. Let me ask you. One of the major programs you work with is installing radiation detectors at ports and border crossings and similar things. And some have said maybe this does not have as much value because it is easy to simply smuggle the materials around these sites. What do you think of that claim?

Ms. HARRINGTON. I have to confess that when I hear that sort of thing, I wonder what else would you do. Every one of us, when we go through an airport, has to walk through a detector, and that is there for a purpose because if you try to go around it, the TSA will not think kindly of it and will probably escort you aside to give you a secondary inspection. The same is true when you look at border crossings, airports, seaports.

But what is important here, just like in an airport, a detector is not effective on its own. It takes people. It takes training. It takes other capabilities along with it. For us, that means mobile units. That means handheld units. That means reaching out to local law enforcement, local intelligence, and bringing them all together as a community to work together on this counter-smuggling effort.

So when people try to say, well, you just stick one piece of equipment someplace, it is not going to work. We would agree with that. But that is not what we do. That is not how we design our programs. And we just actually had—I did not bring this for this reason, but we have a little quarterly newsletter, and a couple of the articles in here happen to be about how we work with the Federal Bureau Of Investigation to develop training programs because we believe that that is an essential element of how we actually are successful in preventing smuggling.

Senator DONNELLY. Thank you.

Senator SESSIONS. Senator Fischer?

Senator FISCHER. Thank you, Mr. Chairman.

Thank you all for being here today.

General Klotz, it is great to see you again. I really appreciated the tours we had of the two facilities in New Mexico but also Lawrence Livermore. It was very educational. And again, thank you for doing that.

General, there is concern that investment in the laboratories is really too limited right now to be able to support any kind of balanced portfolio. You know, we are looking at production and modernization, which should be, I think, the first priority, but you also have to meet necessary scientific capabilities. We need to look at infrastructure. We have to look at attracting creative minds that are able to not just refurbish the weapons that we have but have an understanding of how to create those weapons as well if we are going to, I think, continue to be prepared in the future.

How do you approach that necessary need to balance?

Dr. KLOTZ. Well, thank you very much, Senator, for that question. And I will give, if I could, a broad, general comment, and then, of course, Dr. Cook, who is the scientist here, might like to add something.

You are absolutely right. The scientific, technical, engineering base that we have to do this work is essential not only for production but for maintaining our capability over the longer term, but also addressing other pressing national security needs which all of our laboratories do. So we need to make sure that we attract the very best minds out of technical schools, the very best minds our of graduate schools.

The work that they are given at the laboratories, as you had an opportunity to see firsthand, is leading edge physics. It is leading edge chemistry. It is leading edge materials science. And by attracting people in to do that work, giving them projects to do under our lab-directed research and development, which is an extraordinarily important part of our recruitment and retention capability, in many respects draws them in and keeps them there to work in this laboratory.

I have always thought that in addition to the actual weapons systems themselves and all the people that organize, train, and equip those weapons systems, that our scientific, technical, and engineering base is also an essential pillar of our overall national deterrence policy and the power that we project to nations across the world.

Senator FISCHER. Do you think you are able to then achieve that balance right now with the programs you have in place, or do you think that it is going to have to be phased in in the future, that we take care of the number one priority now and then worry about it in the future? Can we do it now?

Dr. COOK. So we can do some of the balance now. The balance will always change. There is no question that the labs and plants along with them are under the mission assignment of changing the oldest stockpile we have ever had and the smallest since the Eisenhower administration to one that is both smaller and younger. It has to be just as effective. Labs are not developing new nuclear explosive packages, but they are absolutely changing things within those packages and they are doing it with the best simulation that has ever existed, a factor of a million increase since the end of underground testing.

And to give you one example of where excitement is—and it comes right directly to the comment by the chairman about cost reduction and schedule constraint—it is additive manufacturing. So there are ways of really getting right into the science of materials, of making parts.

On the unclassified side, a lot can be published about application to non-weapons products. On the classified side, we are doing some exceptional work at the Lawrence Livermore Lab, Sandia Lab, Los Alamos Lab, and the Kansas City plant. And I would invite you to go through any one of those with us. When you do that, you can see that excitement is palpable, and it drives right to the issue of constraining cost.

And another very quick example, a very important part of additive manufacturing—

Senator FISCHER. I have another question, if I could.

Dr. COOK. All right. You can see the enthusiasm.

Senator FISCHER. I see the enthusiasm. [Laughter.]

I am going to pick up on your comment about the smallest arsenal since Eisenhower. When you look at the size and the cost that is associated with that arsenal, you have commented in the past that those two items do not directly correspond to each other. Nevertheless, we have some that are calling for more reductions, particularly in the hedge that we have, and they view that as a way that we can pursue more cost savings.

First, can you tell me why we have a hedge? Those old weapons—they do not have capabilities. I would like you publicly to be able to address that. And do you believe that reductions in that hedge are going to produce any kind of sizable cost savings?

Dr. COOK. I will try to give you a couple of simple concepts.

We believe that we have to go to the New START force balance by 2018. So deployed weapons will come down to the central limits of the treaty. In doing so, we also believe that we can reduce the hedge, which is the technical hedge, and the way we will get there is through the program of life extensions. What is not so often understood is that the path to reduction of the technical hedge is the path of life extensions. That gets us increased confidence. It gets us a newer set of weapons. We use parts that we have in the technical hedge because we are doing high reuse life extension programs. But these too are moving to a smaller, more trusted deterrent, which is also newer and has a higher ratio of deployed to total, and is entirely within reason.

Senator FISCHER. But would you say cost savings is a false narrative when it comes to the hedge?

Dr. COOK. I would say that with any counting of the weapons only, it is a false narrative to think if you cut the numbers, you are going to save money. The cost is dependent on many other things, and there are large fixed costs.

Senator FISCHER. Thank you very much.

Thank you, Mr. Chairman.

Senator SESSIONS. Senator Heinrich?

Senator HEINRICH. Well, I want to start out and just thank Senator Fischer for making it eminently clear that there is not a linear relationship between the number of devices and the budget ramifications here. I want to thank you as well for coming out to New Mexico to those two facilities, as well as the one in California, and invite any of you any time. I know many of you have visited those in the past, but please come back often.

Admiral Klotz, I was really pleased to hear you talk a little bit about LDRD [Laboratory Directed Research and Development] and its importance for long-term retention. I want to say that the success I think of the ongoing life extension programs generally are largely dependent on the previous investments that we have made in programs like stockpile stewardship that help maintain the unique capabilities at our National labs. And as you know, these capabilities support many other Government agencies in addressing not just nuclear but an entire variety of national security challenges.

I would like your thoughts on whether you think NNSA is doing enough now to ensure that we continue to have the expertise and the technical capabilities to anticipate and respond to future security challenges. And in particular, I am concerned about the labs?

continued ability to attract and to retain that top talent that you talked about.

Dr. KLOTZ. I think we do, but it is a challenge. As you well know, Senator, at all of our laboratories and our production facilities as well, a significant portion, in some cases more than half in some locations, of our enterprise, more than 50 percent of the workforce is eligible for retirement on both the Federal side, as well as on the management and operation contractor side. So again, attracting those people into replace them in a timely fashion is something that we have to deal with in many cases in a marketplace where the same science and engineering and technical skills are highly sought after by startups and high-tech industry.

So it is important, one, I think that we continue to stress to our workforce that what they do is important and it is of enduring importance to the security of this country, and that they are making a contribution to that.

Additionally, it is important that we have consistent, predictable funding in the work they do. Nothing is more dispiriting and demoralizing I think to our workforce than fear of whether what they are working on is going to be seen through to completion.

Senator HEINRICH. Thank you.

As you know, technology transfer is incredibly important to me. It is a primary issue for me. It is not just a secondary one. And this year I introduced a bill, Senate bill 784, with Senator Gardner of Colorado to accelerate tech transfer by establishing an off-campus micro-lab that would serve sort of as a front door for national laboratories. Our 17 national labs annually conduct more than $12.5 billion in publicly funded research, but often times that is behind the fences. While it has proven to deliver a number of spin-off technologies, that is a real challenge for the kind of collaboration that we have really seen effectively accelerate those things. So the goal of this legislation is to give business owners and regional academia, even local government greater ability to interface with those resources.

As NNSA Administrator overseeing three of the largest labs in the country, I would love your thoughts on this concept generally and if the Federal share of funding were available from existing tech transfer funds, would you be willing to carry out a pilot program at one of the labs to explore this concept further and to be able to evaluate the results?

Dr. KLOTZ. Thank you, Senator, and thank you for your personal interest on this as well. As you know, the NNSA labs have already transferred a lot of their innovations to industry, a lot of it in the engineering area, but also in medicine, in climate prediction, a whole host of issues.

An ongoing challenge, as you pointed out, has been how do you have an interface between the entrepreneurial community and the broader academic community when a lot of our work is done behind the wire, behind the fence, and there are security barriers to doing that.

So we are very supportive of the efforts that you have outlined to accelerate technology transfer within the statutory and appropriations constraints that we have to live with. And we support the notion of a pilot plant. And as you know, Sandia Laboratories has

been in the lead in setting up a center for—or proposing a center for collaboration and commercialization in Albuquerque, as well as joining with Livermore National Laboratory in setting up the Livermore Valley Open Campus concept. So these are things which I know Secretary Moniz is very interested in pursuing. In fact, he has set up an office especially to do tech transfer, and we in NNSA fully support that and will be doing that in our own mission space.

Senator HEINRICH. I look forward very much to working with you on that.

Thank you, Mr. Chairman.

Senator SESSIONS. Senator Graham?

Senator GRAHAM. Thank you, Mr. Chairman.

What is the effect of sequestration on your ability to do your job if it goes back into effect?

Dr. KLOTZ. Thank you, Senator. We think that it would be—pick your adjective—devastating. It would certainly force us to take a look at the programs and projects that we have laid out. Clearly many of those programs and projects would have to be delayed, which would drive costs even higher for those programs, and in some cases might actually have to be eliminated.

Anything that we did in terms of our weapons programs would have to be something we would do collaboratively with DOD and STRATCOM because we develop a warhead to go on one of their delivery systems, and to the extent that that was impacted by limits of the Budget Control Act, it would inform how we would proceed with our own life extension programs and the scientific programs that support those.

Senator GRAHAM. Would you say it would seriously compromise your ability to perform your duties for the country?

Dr. KLOTZ. It would have a serious impact, yes, sir.

Senator GRAHAM. MOX.

Dr. KLOTZ. Yes, sir.

Senator GRAHAM. Okay, our favorite subject. [Laughter.]

About 60-plus percent built. Do you agree with that?

Dr. KLOTZ. There are a number of ways in which you can say "percent built." I will not argue with you over 60 percent.

Senator GRAHAM. Some say 67. I say 60. It is over half built.

Dr. KLOTZ. We agree with that, over half built.

Senator GRAHAM. The treaty with Russia regarding the MOX program takes 30-something tons of weapons-grade plutonium off the market in Russia and the United States. That is a good thing. Right?

Dr. KLOTZ. Absolutely.

Senator GRAHAM. Maybe one of the best nonproliferation agreements we have negotiated with anybody.

Dr. KLOTZ. Yes, sir.

Senator GRAHAM. We do not want to lose that.

Dr. KLOTZ. No, sir.

Senator GRAHAM. In 2010 in the last update of the treaty, the United States said that we would use MOX as the disposition method. Is that correct?

Dr. KLOTZ. That is correct.

Senator GRAHAM. So over half built, 60 percent. At the end of the day, they are studying alternatives. I have been looking at this

since the 1990s. I do not see an alternative that is workable, that saves money, but I guess we will wait and see.

From your point of view, to abandon the disposition of this material, would that be wise?

Dr. KLOTZ. Senator, like you, we will be very interested in the results of the reports, which were mandated by Congress. The first one is due now and will be out within a matter of days. It will look at two alternatives: the MOX alternative, the one we have now, as well as an alternative that is referred to as——

Senator GRAHAM. Right. I guess my question is you would not suggest that we just basically withdraw from the treaty.

Dr. KLOTZ. No, sir.

Senator GRAHAM. So we are going to do something with this material.

Dr. KLOTZ. We should do something with this material.

Senator GRAHAM. If we do not, we are making a huge mistake.

Dr. KLOTZ. I would not disagree with that.

Senator GRAHAM. The last thing you want to do right now with the Russians is break a treaty with them over reducing the amount of weapons-grade plutonium they possess.

Dr. KLOTZ. Yes, sir.

Senator GRAHAM. So all I ask of the NNSA is that when we look at these alternatives, we understand that the goal is still the same, which is to alleviate the material. We have made a treaty with the Russians to go the MOX route. I have no interest in going back to the Russians and saying, hey, would you work with us to change this because I do not think that is particularly smart right now. We will stay on top of the cost, and when we get these reports, I look forward to talking to you.

But at the end of the say, South Carolina, Mr. Chairman, has agreed to accept this weapons-grade plutonium years ago, 34 tons, enough to build thousands of warheads. Is that fair to say?

Dr. KLOTZ. Yes.

Senator GRAHAM. How many would you say, Ms. Harrington?

Ms. HARRINGTON. 34 tons divided by 8 kilograms per weapon.

Senator GRAHAM. So what does that come out to? Thousands.

Ms. HARRINGTON. Thousands.

Senator GRAHAM. Okay. So we got thousands of warheads that can be made from this material, 60 percent completion of the disposition method. South Carolina signed up for this a long time ago understanding certain things would happen. From the Department's point of view, the last thing you want to do in my view is to tell the State that you are going to do something, get the State to sign up for a mission that is—you know, this is pretty tough stuff, taking weapons-grade plutonium in your own State—and bail out on them. You do not want to bail out on the Russians. You do not want to bail out on South Carolina. So please understand that how we deal with the MOX program is going to affect a lot of things in the future.

Dr. KLOTZ. Yes, sir.

Senator GRAHAM. Thank you very much.

Thank you, Mr. Chairman.

Senator SESSIONS. Thank you.

If the sequester remains in effect, which the budget we passed does not—or at least provides more money for the Defense Department, what percentage of reduction in your numbers—was it $8.9 billion we are scoring you to have next year? Can you give an exact figure or would you know what it would be if the sequester stayed in place?

Dr. KLOTZ. Our overall budget request was for 12.6.

Senator SESSIONS. I have 8.9. What is the difference? What are we talking about?

Dr. KLOTZ. So in the weapons activities, that is the 8 percent, that portion of it. Again, it would depend on how—since we and the rest of the Defense Department all draw from the 050 budget account, it would depend on how things were allocated—

Senator SESSIONS. DOD would make some allocation choices.

Ms. Harrington, Mr. Trimble mentioned the Russians and the ceasing of cooperation. We just have a few minutes, but can you give us briefly where we are with cooperation with the Russians on nonproliferation and what that means for us?

Ms. HARRINGTON. Certainly, Mr. Chairman.

As you know, we have over 2 decades very close cooperation with the Russians, and we are very disappointed to see that Russia has chosen not to continue to work with us. We continue to view Russia as still being one of the highest risk countries in the world. They have huge stockpiles of highly enriched uranium and plutonium, and despite the fact that we, in partnership with our labs, have helped them improve their practices, improve their security, develop training programs, even helped them set up their own training center for security, we still lack the confidence that they recognize the scope of the problem, the issue of dealing with insider threats, and quite frankly, the materials that we have seen being smuggled. Real nuclear materials smuggled have all come out of the former Soviet Union.

Senator SESSIONS. What kind of history can you share with us of actual smuggling of nuclear materials out of Russia?

Ms. HARRINGTON. We would be happy to come back in a classified setting and share that detailed information with you.

Senator SESSIONS. Okay.

Now, when you say they have ceased to cooperate, to what extent does that create risk? Can you give specific examples in this public setting?

Ms. HARRINGTON. Well, for example, one of our primary efforts in Russia—and it was a very unique opportunity—was to work with them not just on stockpiles, but actually work with them on the security of the facilities where they store their warheads. So extremely important in terms of maintaining control over the most single largest threat that could be posed against us. So that kind of work we are no longer able to do directly with them.

Senator SESSIONS. They said no longer can you come to our facilities?

Ms. HARRINGTON. Correct.

Senator SESSIONS. Did they explicitly state the reason for that?

Ms. HARRINGTON. They have stated that in the future they will be able to fully support all of the security programs that we had developed with them by themselves. They will support it out of

their budget, and because they will be funding it, they do not see a need for us to be on site.

Senator SESSIONS. General Klotz, the January 15 STRATCOM report on balance in nuclear weapons programs suggests that due to the current funding emphasis on certifying the nuclear stockpile and performing life extension programs on aging weapons, there may be insufficient funding and science activity to, "prepare to respond to future uncertainties." And there is concern about losing, quote, a full design and production capability. Close quote.

What can you do to ensure our labs maintain a responsive design capability to address future uncertainties?

Dr. KLOTZ. Thank you, Mr. Chairman.

That is also a concern we share. As Dr. Cook mentioned earlier—I will let him amplify if he would like—striking a balance between the production that we need to do today, which depends an awful lot, obviously, on science and engineering, and for the future is one that we have to pay attention to and that we worry about, particularly with an aging workforce both on the Federal and the laboratory and plant production sides. But the work that our scientists, technicians, and engineers do at the laboratories and in the production facility really is leading edge physics, chemistry, materials science, computing science, and I think that the skill that they developed in terms of working with the existing systems and keeping them up to date provides the basic necessary requirements they would have to have for any future contingencies that would arise.

Dr. COOK. If I were to add to that——

Senator SESSIONS. Please, go ahead.

Dr. COOK. Briefly, in the 2 decades since we stopped underground testing, it took about a decade to put the facilities in place for stewardship. It took about another decade to really get them under control, get the diagnostics there, get the people trained. We have achieved that now. There are still refinements to be made, but at all of the labs, they each now have facilities that are driven to get uncertainties down in the simulations that we have. And over the last 2 years, with stable budgets and your support, we have achieved the level of experimental productivity in laser experiments and accelerated experiments and hydrodynamic experiments, explosive experiments that are really challenging the people and driving the codes. That comes right to the issue of challenging people. A lot of good training of people who have university backgrounds, but they are not trained in the weapon program until they get in the labs. All of that really is going on. And that is a part of the program that is not often seen.

Senator SESSIONS. Thank you. I do think good, challenging work that is important to America is a motivating factor and keeping people busy is better than not being busy. Do you not agree?

Mr. TRIMBLE. Absolutely.

Senator SESSIONS. This is important work and we need to make sure our people are properly challenged.

Senator Donnelly?

Senator DONNELLY. I just have a couple of questions I would like to follow up with, somewhat along the same line, Dr. Cook. Much has been commented regarding balancing, overhauling the aging stockpile, and keeping our scientists at the forefront to hedge

against uncertainty. So how do you work that nuance of achieving the balance between the two?

Dr. COOK. The short answer is through appropriate challenges. An immediate example right now is with the W80 Mod 4. In a modern way of looking at the alternatives we have, we are really challenging the labs to use their best codes, their best people, and get into some experimental data instead of guessing about what the results are with regard to a materials model, the behavior of materials, for example.

Another way is looking at all the concepts and the ways that we could run the interoperable weapons for the Air Force and the Navy. While that effort is delayed, we have got some time to really go through in a more formal way challenging the people to look at some things that would otherwise be considered out-of-the-box and too risky. And so I am back to the experiments again. Experiments are being done with explosives driving both surrogate material and then in Nevada now plutonium to determine whether some of the ideas for improving things, including stuff like additive manufacturing and less toxic materials, can actually pay off. That is the way we get the balance. The engineering side very heavily taxed, but as the chairman just said, we are absolutely keeping the design side as challenged as we can.

Senator DONNELLY. Thank you.

Mr. Trimble, follow up a little bit on MOX. What do you see as the root causes of the large cost overruns that have happened there?

Mr. TRIMBLE. In I think it was 2014, we did a report looking at MOX and the cost increases. We were trying to get at that issue of what were the cost drivers. At the time, DOE had not done a formal root cause analysis. They had identified some areas that they believed are the reasons for their cost increases such as unanticipated safety requirements from the NRC and other things. As a result of that work we did, we recommended they conduct a formal root cause analysis.

In January 2015, DOE came out with their root cause analysis. They identified three key areas driving those cost increases. One was the lack of experienced staff. One was the lack of alignment of contract incentives with performance, and one was the atrophy of the supply chain.

We have now gone back to look at that analysis that they have done to see how thorough it was, or sometimes in the past, we have had concerns that what have been identified as causes are not really necessarily a reason, for example, if you had lack of experienced staff. The real cause is what led you to have inexperienced staff on that case. So those are the kind of questions we would look at.

I think one of the things that was interesting was that out of that root cause study, they came up with a number of recommendations. 11 recommendations came out of DOE's root cause study. I think that speaks to another recommendation we had in that report, which was for DOE to establish a requirement to always conduct a root cause analysis when your cost increase or your schedule delayed by about 25 percent. This is like on the DOD side. I think it is the Nunn-McCurdy breach, if I am remembering correctly. We had a recommendation for DOE to pursue the same thing when

they had a similar kind of overrun in their programs. Unfortunately, DOE disagreed with that recommendation.

Senator DONNELLY. Thank you.

Admiral, we would not want you to come all the way over here without throwing a pitch your way. So you are building a new spent fuel rod—a new spent fuel pond—I am sorry—at the Idaho National Lab. It has gone backwards a little bit due to the lack of appropriations. And I was wondering if you can explain the importance of this effort and what the delay has cost the program and what the cost will be if it continues this way.

Admiral RICHARDSON. Senator, thanks for the question, and thank you very much to everybody on the committee for their firm support of naval reactors.

As I begin to answer the question, I would just like to compliment General Klotz and my colleagues in articulating the challenges that they share. And naval reactors, by virtue of managing the naval nuclear propulsion program from cradle to grave, shares all of those challenges whether it has attracted the right people, maintaining the right tools and equipment, and the infrastructure. All of those challenges, including tech transfer—we share those inside the naval nuclear propulsion program.

Part of our challenge today is to recapitalize a spent fuel handling facility. To call it a pond is really to oversimplify it.

Senator DONNELLY. That would be my specialty. [Laughter.]

Admiral RICHARDSON. It is an absolutely critical node in our management of our program. All of the naval nuclear spent fuel goes to that facility for eventual processing and transition into dry storage, awaiting shipment to a national repository when ready. Without a facility that manages that production line efficiently to meet fleet needs, we would quickly become backed up and we would have to bring aircraft carriers and submarines and leave them next to the pier rather than underway.

By virtue of the delays, we have incurred some costs, and before I describe those, I would like to say, though, that particularly in the last year, we got a tremendous signal from Congress to start funding of that facility in a serious manner, and we have come out of the blocks at a sprint to reach critical decision one. We are ready to publish our environmental impact statement this year. And so we are moving out briskly to move this down the track.

It has cost us some. We have been delayed about 5 years from our original plan. That has resulted in about $400 million in escalation and inefficiency costs just moving the facility, as well as $500 million to buy temporary storage containers to store aircraft carrier fuel until the new facility is built. So we had a plan in place to recycle those containers. With the delay in the facility, there is no place to recycle them through, and we have to just store it and build temporary facilities.

Going forward, we would see the same thing if it was delayed further. But as I said, I think we are off and running on that. We anticipate starting construction on that after getting the design very mature in about 2019, bringing the facility online in 2024, fully operational in 2025.

Senator DONNELLY. Thank you, Admiral.

Senator SESSIONS. Senator Heinrich?

Senator HEINRICH. Thank you, Mr. Chairman.

Dr. Cook, I understand that there may be a need in the future for a new source for tritium production. As you know, that only has a 12-year half-life. To produce tritium in a commercial power reactor and provide a new domestic facility to enrich the uranium fuel could literally cost taxpayers several billion dollars. In your view, could we secure enriched uranium instead from our allies such as in the UK to be used for tritium production instead of spending this very large amount of money, which inevitably would come out of the weapons budget?

Dr. COOK. I will answer the first part of this, and then I will turn to Under Secretary Klotz for the second part.

The first part is for the current supply of unobligated uranium, we are good for a period time. We know what the time is. And we actually provide tritium to the entire stockpile. So we know what the needs are.

With regard to other sources of uranium, we are doing an in-depth study, but that might only get us down a period of time. Eventually the country needs a domestic source of uranium enrichment not only for tritium production, which we do with low-enriched uranium, but also for naval propulsion, which requires a higher level of enrichment. So we will not dodge that bullet, but we might extend the time if we find some more material. Nevertheless, we are adhering to the State Department and its obligations, our obligations, under existing treaties.

Is there anything you wish to add?

Dr. KLOTZ. The only thing I would add is we have to ask ourselves if we a major nuclear power—and we are—do we need the capability to do some of the basic things associated with being a major nuclear power, and that is providing low-enriched uranium to produce our own tritium as opposed to relying upon even our closest allies and friends, and over the longer term, developing highly enriched uranium ultimately for the U.S. Navy, which uses it in over 40 combatant ships.

So this is an issue which the Congress has asked us to provide a report on in terms of what our tritium needs are, what our low-enriched uranium needs are in order to produce tritium, and that should be coming out very, very shortly.

But again, I think the fundamental question is what do we as a Nation need in terms of capability in this regard.

Senator HEINRICH. Well, I would certainly suggest we should also look at the cost/benefit analysis there as well.

Thank you.

Let us see. One last question I guess for Administrator Klotz. Can you speak to whether there are any plans for the National labs to work with IAEA [International Atomic Energy Agency] in order to make sure if there is potential for adding additional trust and confidence to the inspections that are planned under the recent framework that was announced with Iran? Can you speak at all to whether or not there would be opportunities there for adding additional levels of security to that arrangement?

Dr. KLOTZ. Let me just say at this stage, Senator, that as Secretary Moniz has said in his public statements and I believe in his briefings to Members of both houses, that a lot of the policy deci-

sions that were part of the negotiation process were informed by the technical knowledge, expertise, and analysis that was done within our labs and within our production facilities. And I would expect that that would be an important part of further steps in bringing about an agreement and, if an agreement, implementing that agreement.

Senator HEINRICH. Well said. Thank you.

Senator SESSIONS. Thank you.

We thank you all.

I would ask General Klotz. On the basis of money expended and the estimated cost of the MOX lab, what percentage of the money expended are we at at this point?

Dr. KLOTZ. Senator, that depends upon your assumption of how long—what the annual appropriation will be, what we will spend on that, and how long it would take to finish the project. The longer we take to do it, the more the cost will be, and therefore, our cost to go would vary. I do not know if there is anything we would add to that.

Senator SESSIONS. So you do not have a percentage.

Dr. KLOTZ. I do not have a percentage. It depends on your assumption of how much we are going to fund that. You know, funding it at the current level, as Secretary Moniz has said, is not optimal funding, if what you are trying to do is to bring the project to closure. The less you spend, the longer it takes to bring the project home and the more expensive that is. So what we have spent to date would be a function of how long we expect that we would take to complete the project.

Senator SESSIONS. The criticism at NNSA has been that you have been unable to plan, manage, or oversee and hold accountable a nuclear weapons expertise on time, within cost. The Mies-Augustine congressional advisory panel on the governance of the nuclear security enterprise found mismanagement at DOE and NNSA to be largely to blame for these flaws. The NDAA for Fiscal Year 2015 directed you, Administrator Klotz, to provide views on this panel's recommendations. We have not received those yet I believe. Do you expect to have your reviews on that?

Dr. KLOTZ. Yes. I hope that this will come up here very, very soon. It is still in the coordination process within our own Department.

Senator SESSIONS. So, Mr. Trimble, do you have anything to add to that discussion of where we are and any ideas for corrective action?

Mr. TRIMBLE. Well, I think in my opening statement, my general comment is I think there are some areas where we have made specific recommendations where I think progress could be made in terms of cost estimating and analysis of alternatives, looking at programs. I think work we have ongoing that will be out later this year looking at contract management and reliance on contractor assurance systems will also dovetail nicely with the Mies report.

Senator SESSIONS. With regard to, I think, Senator Heinrich's question, maybe to follow up on that, General Klotz what is NNSA's assessment concerning the ability of Iran to mount a future nuclear weapon atop an ICBM or cruise missile? And do the

National labs have expertise that contributes to that discussion and analysis?

Dr. KLOTZ. Well, in terms of specific capabilities of Iran or any country, I think we would have to discuss that in a smaller setting. But again, as responded to the Senator from New Mexico, there is extraordinary capability within our laboratories to do the types of research and analysis that can help inform our policymakers as they deal with——

Senator SESSIONS. And they are doing that now? And there are no prohibitions that you are aware of in that cooperative effort—law or policy.

Dr. KLOTZ. In terms of informing policy, no.

Senator SESSIONS. Well, thank you all. It is an important hearing. You have a very important role in the National security. My impression, I will state again, is that some of the complaints that have been outlined, GAO and others, are being addressed effectively, and I have a sense that there is a tighter control and a more focused operation ongoing under your leadership, General Klotz. And we thank all of you for what you do. We appreciate your cooperation and service.

We are adjourned.

[Whereupon, at 3:46 p.m., the subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR ANGUS S. KING, JR.

OHIO REPLACEMENT PROGRAM

1. Senator KING. Admiral Richardson, can you explain how you are synchronizing the development of the new reactor plant for the *Ohio*-class replacement submarine, with the development of the submarine itself?

Admiral RICHARDSON. Naval Reactors is advancing the design of the *Ohio*-class Replacement propulsion plant on the schedule laid out in 2010. The only change to the original schedule stems from the Navy's decision to delay construction of the first ship from fiscal year 2019 to fiscal year 2021; Naval Reactors adjusted the propulsion plant development timeline to maintain alignment with the Navy following the schedule shift.

Naval Reactors' Departments of Energy and Navy efforts are directed at supporting this schedule, including development of the propulsion plant design to support procurement of long-lead components in fiscal year 2019 to enable a construction start in fiscal year 2021 and ship delivery in fiscal year 2028. After completing ship operational testing, the first *Ohio*-class Replacement must be on strategic patrol by 2031 to meet STRATCOM force level requirements. Given that the first *Ohio*-class Replacement submarine, a ship twice the size of the *Virginia*-class submarine, is planned to be constructed within the same span of time, this schedule is aggressive and requires close coupling of Department of Energy and Department of Navy activities to ensure on time ship delivery.

To achieve this alignment, the design team has been in close coordination with the Lead Design Yard (Electric Boat) and Navy Leadership. The Chief of Naval Operations, in coordination with the Joint Staff, sets the ship requirements that drive decisions on reactor plant size and performance. The Navy's Program Executive Officer for Submarines and Naval Sea Systems Command coordinate with the *Ohio*-class Replacement Lead Design Yard, who is responsible for translating ship capability requirements into the overall submarine design specifications. As part of this overall coordination, Electric Boat developed a detailed construction schedule that specifies the required-in-yard dates for reactor heavy equipment, which is needed early in the build period, to support the construction timeline. These required-in-yard dates feed back into the design schedule to ensure that the design and follow-on component fabrication schedules are also aligned.

In addition to the coordination between Naval Reactors and the Navy's shipbuilders, the design and construction of *Ohio*-class Replacement requires extensive coordination and alignment with the Navy's Strategic Systems Programs that are

responsible for the missile systems and the British Navy, who will use the Common Missile Compartment design in their upcoming fleet ballistic missile submarines (SSBNs). Because they each depend so heavily on each other, these four design efforts must all remain tightly aligned and in close collaboration to retire risk early and minimize construction costs.

Given the criticality of Naval Reactors' Department of Energy activities which are aligned to Navy priorities and mission, strong support for Naval Reactors' Department of Energy budget is absolutely critical to this facet of the nation's security.

2. Senator KING. Admiral Richardson, are there any points of risk that this subcommittee should be aware of as the Navy undertakes this massive project?

Admiral RICHARDSON. The Program remains on track to support reactor plant heavy equipment procurement of long-lead components in fiscal year 2019 enabling the lead ship construction start in fiscal year 2021 and ship delivery in fiscal year 2028. After completing ship operational testing, the first *Ohio*-class Replacement must be on strategic patrol by 2031 to meet STRATCOM force level requirements. Within this aggressive program, two areas warrant special attention: ensuring the integration of the electric drive components into a fully functioning system meeting the *Ohio*-class Replacements' stealth requirements; and the manufacturability of the new cladding material for the life-of-the-ship reactor. My staff is focused on ensuring Naval Reactors delivers both of these technologies to the Navy. The risks are well known and a plan is in place to retire them, but it is a multi-year plan that requires firm funding support. With that support, combined with our past record and experience, these integration challenges are manageable and currently support the construction of the lead ship starting in f 2021.

NNSA MANAGEMENT AND MODERNIZATION CHALLENGES

3. Senator KING. Mr. Trimble, the Government Accountability Office (GAO) has identified a number of challenges the National Nuclear Security Administration (NNSA) faces in its plans to modernize the nuclear security enterprise. How many of those challenges are a result of unpredictable budgets versus structural problems?

Mr. TRIMBLE.

GAO has not conducted work specifically focused on the extent to which unpredictable budgets or structural problems present challenges to NNSA's modernization plans.

Our work on budget estimates for modernization has shown that at the top line, funding for NNSA modernization activities has been fairly close to the levels originally planned in 2010 for budgets through 2019. However, there have been more significant changes from year to year at the individual program level, including instability in the schedules for major modernization efforts:

- The schedules for life extension programs have changed every year that GAO has evaluated them, which results in budgetary shifts.
- The schedules for construction of replacement plutonium and uranium facilities have significantly shifted and the scopes of these projects remain in flux.

Our work has also shown weaknesses in cost and budget estimation processes that inform plans to modernize the nuclear security enterprise.

- GAO has made numerous recommendations to correct NNSA's project management problems—for example, for improving cost estimating capabilities and employing a rigorous analysis of alternatives to ensure that key capital asset and program decisions will both meet mission needs and be cost-effective. While NNSA has initiated some actions and made some progress, the agency has not taken action on many of these recommendations, which suggests a lack of urgency or commitment on DOE's part to address identified challenges.

Also, as we noted in our high risk update (February 2015), NNSA does not have the capacity (people and resources) to resolve contract and project management problems. NNSA has taken some actions to address capacity issues, but these actions have not yet ensured that the department has the capacity to fully address its contract and project management challenges.

QUESTIONS SUBMITTED BY SENATOR MARTIN HEINRICH

LOS ALAMOS TRANSURANIC WASTE

4. Senator HEINRICH. Dr. Klotz, my understanding is that the Department of Energy's (DOE) Office of Environmental Management is taking over management of the cleanup and disposal of transuranic wastes at Los Alamos National Laboratory (LANL). Much of the waste to be disposed of is legacy waste; however, how will the NNSA coordinate with the Office of Environmental Management for disposal of plutonium waste that is generated in future LANL operations?

Dr. KLOTZ. The Secretary of Energy has directed NNSA and EM to transition the acquisition and management of EM-funded legacy cleanup work at Los Alamos from NNSA to EM. EM will assume direct management of prime contracts established for EM-funded cleanup work at Los Alamos. The Secretary has further directed that the two organizations work collaboratively to accomplish the transition so as to avoid gaps in responsibilities and minimize to the extent practicable duplication of effort or overlapping responsibilities. Since 2001, the National TRU Waste Corporate Board serves as a consensus-building and advisory body to the Assistant Secretary of Environmental Management to integrate DOE TRU Waste Complex disposition activities. NNSA and EM have protocols to facilitate coordination specifically on facilities and infrastructure issues related to TRU waste management at LANL to supplement existing coordination mechanisms. This includes legacy TRU waste and the newly generated waste from future operations. EM and NNSA employees at LANL and at Headquarters are in near-daily contact and participate on integrated project teams, review committees, and working groups together. NNSA and EM interact on a daily basis through our respective staffs in the Field and Headquarters with the more-formal coordination mechanisms discussed above, and in participation with integrated project teams, review committees, and working groups. We will continue with this approach as the contract transition activities progress over the next 18–24 months.

REPLACEMENT OF THE CMR BUILDING AT LOS ALAMOS

5. Senator HEINRICH. Dr. Klotz, my understanding is that Los Alamos is starting to transfer operations from the old Chemistry and Metallurgy Research (CMR) building into PF–4 and the new Radiological Laboratory, Utility and Office Building (RULOB). Once the transition is complete, which office will assume responsibility for managing the demolition and disposal of the old CMR building—the NNSA or the Office of Environmental Management?

Dr. KLOTZ. Facilities transfer to the Office of Environmental Management (EM) only after an EM review has confirmed the facilities meet the transfer criteria in accordance with DOE Order 430.1B, *Real Property Asset Management.* The program ultimately responsible for demolition cannot be presumed until after EM has conducted its review. The Department's management of excess facilities such as CMR is the subject of an ongoing Department level review. Plans for CMR will be finalized within the framework of the results of that review.

DOE'S EMERGENCY OPERATIONS CENTER

6. Senator HEINRICH. Ms. Harrington, you are responsible for maintaining the Department's Emergency Operations Center for nuclear terrorist incidents as well as incidents such as fires and releases of radiation at DOE facilities, such as the Waste Isolation Pilot Plant (WIPP) in New Mexico. Have you conducted an internal review of how well the emergency operations center responded during the two incidents at WIPP in February 2014 and were you satisfied with the performance?

Ms. HARRINGTON. The NNSA Office of Emergency Operations manages the Department of Energy's (DOE) Emergency Operations Center (EOC), which maintains situational awareness of the DOE complex. In addition to providing situational awareness, the DOE EOC provides headquarters awareness and expertise for incidents requiring departmental decision, including performing notifications, disseminating information, and providing subject matter support. The emergency response to the incident at the Waste Isolation Pilot Plant was managed on the ground by the Nuclear Waste Partnership LLC. A review of the incident found there were delays in notification to the DOE EOC. In accordance with DOE Order 151.1C, Comprehensive Emergency Management System, State and local officials, the Cognizant Field Emergency Operations Center (EOC) and the Headquarters Operations Center must be notified within 15 minutes and all other organizations within 30 minutes of the declaration of an emergency. By design and in practice, the DOE EOC is the first government official to be notified by the LLC. Once notified, the DOE EOC responded in accordance with Departmental policies. While the EOC acted in accord-

ance with policy, there is room for improvement in terms of coordination with the sites to ensure timely notifications. DOE continues to work with all its Sites and Facilities to ensure reporting requirements are fully understood; communications gaps are identified and resolved; and enterprise-wide situational awareness and emergency management are enhanced. To address gaps, DOE is currently working to revise DOE Order 151.1C on emergency management to alleviate inconsistent interpretation and implementation of requirements at some DOE sites and incorporate lessons learned.

SCHEDULE TO RESTART OPERATIONS AT WIPP

7. Senator HEINRICH. Mr. Trimble, I understand the GAO has been reviewing the plans and schedule to restart limited operations at the Waste Isolation Pilot Plant as soon as fiscal year 2016. What are GAO's observations about the current schedule to resume normal operations and the planned restart process?

Mr. TRIMBLE. As you noted, we are conducting an ongoing review for this committee on DOE's plans to restart the WIPP facility. In particular, we are assessing (1) actions DOE is taking to improve the oversight of the contractor responsible for operating the WIPP facility, (2) the extent to which DOE has reliable cost and schedule estimates for restarting the facility, and (3) whether DOE used a reliable process for selecting its proposed solution for upgrading the WIPP ventilation system. We plan on briefing the committee within the next several months on the results of our review.

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2016 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, APRIL 22, 2015

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

AIR FORCE AND NAVY NUCLEAR PROGRAMS AND THE IMPLEMENTATION OF NUCLEAR ENTERPRISE REVIEW RECOMMENDATIONS

The subcommittee met, pursuant to notice, at 3:00 p.m. in room SR–222, Russell Senate Office Building, Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Inhofe, Sessions, Donnelly, King, and Heinrich.

OPENING STATEMENT OF SENATOR JOE DONNELLY

Senator DONNELLY [presiding]. I would like to thank all the witnesses for being here, and you can take a seat.

Senator Sessions will be here in just a moment. He is on his way over.

I will read my opening statement, and we will keep rolling along until Senator Sessions gets here. Thank you all very much.

I want to thank Senator Sessions for holding this important hearing. Over a year ago, we had a failure in ethics for both the Air Force and Navy nuclear missions. For the Air Force, this involved cheating on Intercontinental Ballistic Missile (ICBM) proficiency exams. For the Navy, it involved cheating on naval reactors proficiency exams. While integrity of the Air Force nuclear weapons was never compromised, it pointed to a readiness and morale problem associated with the demanding mission that Strategic Command requires and how the Department of Defense (DOD) has paid a lesser amount of attention to its nuclear mission.

One may have varying opinions of nuclear weapons, but as long as they exist and other nations have them, it will remain, as Secretary Carter termed, as the bedrock of our defense posture. We cannot let this mission lapse.

I am gratified the Department has taken a head-on approach to correcting these issues with the nuclear mission, and we are anx-

ious to help support the readiness of our deterrence posture now and in the future.

Again, let me thank everyone for their attendance today. I look forward to your testimony, and Senator Sessions should be here with us in just a few minutes. And we will go left to right. Ms. Creedon, thank you.

STATEMENT OF HON. MADELYN CREEDON, DEPUTY ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Ms. CREEDON. Thank you, Senator.

I would also like to thank Chairman Sessions, obviously when he gets here——

Senator DONNELLY. He gets thanked more while he is not here than when he is here.

[Laughter.]

Ms. CREEDON.—as well as the other members of the subcommittee.

Thank you very much for the opportunity to discuss with you today the report of the Department of Defense internal nuclear enterprise review team. My co-chairs on the review were Rear Admiral Peter Fanta, former Deputy for Resources and Acquisition, Joint Chiefs of Staff; and Sergeant Major Patrick Alston, the command's senior enlisted leader of the U.S. Strategic Command.

Our internal review of the Department of Defense nuclear enterprise started in February 2014 at the direction of former Secretary of Defense Chuck Hagel. He started this after a series of troubling events involving the Nation's deterrent forces and their senior leadership when he directed both an internal and an external review of the health of the nuclear enterprise.

The external review was conducted by former Air Force Chief of Staff and Commander of the Strategic Air Command, General Larry Welch, and former Commander of Fleet Forces Command, Admiral John Harvey. Their report, the Independent Review of the Department of Defense Nuclear Enterprise, as well as the report of the internal review team, were provided to Congress this past November.

For the most part, the findings of both the internal and the external reviews were very much in line. There were, however, some differences in the recommendations. Our internal team's report is a classified report. As such, I have attached to my written statement an unclassified summary describing the findings and the recommendations of the internal review team's report. The fact sheet was also provided to Congress in November, along with our report.

One of the key findings of our internal review team was that in spite of the shortcomings in the enterprise—and there were many—the men and women of the nuclear enterprise are dedicated and committed to the mission and the work. And they work exceedingly hard to ensure the safety and the security of the U.S. deterrence forces. On balance, the forces, including the civilians, were understaffed, under-supported, under-appreciated, and in many instances were working with out-of-date equipment, a shortage of parts, and inadequate facilities.

We also found that some of the fixes of the past had actually made things worse. As a result, we stressed in our report that an

approach that simply checks the box and moves on is not the correct approach. This sort of approach will fail to recognize the interconnected nature of many of the problems and that many of the solutions are often long-term, organizational, and cultural.

We had a fairly long list of key findings in our report, which are summarized, as I mentioned, in my written statement. But I wanted to take the opportunity to highlight that the most important of our recommendations are those that will help the people who work in the nuclear enterprise every day get their job done. These men and women are our most important asset in the nuclear enterprise.

I want to close now by not only thanking the entire internal review team for their work, but also former Secretary Hagel for caring enough about the enterprise to bring his personal attention and credibility to its problems. He got the attention of the senior leaders in the DOD and the services. Already, there are some good results and some good efforts, and you will hear more about these from my colleagues on the panel here today. The real challenge, however, is to maintain that focus, energy, and attention for the long term.

Thank you very much, and I look forward to your questions.

[The prepared statement of Ms. Creedon follows:]

PREPARED STATEMENT BY HONORABLE MADELYN CREEDON

Chairman Sessions, Ranking Member Donnelly, and members of the subcommittee, thank you for the opportunity to discuss with you today the report of the Department of Defense Internal Nuclear Enterprise Review team. My co-chairs on the review were Rear Admiral Peter Fanta, former Deputy for Resources and Acquisition, Joint Chiefs of Staff, and Sergeant Major Patrick Alston, Command Senior Enlisted Leader, U.S. Strategic Command.

Our internal review of the Department of Defense (DOD) nuclear enterprise was undertaken beginning in February 2014 at the direction of former Secretary of Defense Chuck Hagel, after a series of troubling events involving the nation's nuclear deterrent forces and their senior leadership. In addition to the internal review team's report: *Internal Assessment of the Department of Defense Nuclear Enterprise,* Secretary Hagel also directed an external review and report. The external review was conducted by former Air Force Chief of Staff and Commander of the Strategic Air Command, General Larry Welch, and former Commander of Fleet Forces Command, Admiral John Harvey. Their report: *Independent Review of the Department of Defense Nuclear Enterprise,* and the report of the Internal review team were provided to Congress this past November.

Our internal team's report is a classified report. As such, I have attached an unclassified summary describing the findings and recommendations of the internal review team's report, as well as a fact sheet developed by DOD that sets out a description of the implementation plans for changing the nuclear enterprise. Both the fact sheet and the summary were also provided to the Congress in November.

Over the course of three months, a team of 96 professionals, drawn from the relevant components of the Office of the Secretary of Defenses, the Joint Staff, Military Services, and the Defense Agencies, visited all of the operational nuclear facilities and most of the supporting facilities in CONUS, and a representative sampling of the nuclear forces in Europe. We established three sub-teams: Personnel, Performance, and Investment, to facilitate our review. We talked to over 1,500 people—offices, enlisted, civilian, and contractors who were directly involved in or provide training, education and support to the DOD nuclear enterprise.

We talked with aircraft, missile, and warhead maintainers, shipyard workers, civil engineers, submariners, missileers, pilots, teachers and instructors, supply, sustainment and parts specialists, engineers, personnel specialists, doctors, nurses and medical technicians, security forces, financial managers and budget specialist, at all levels and ranks. Conversations were held individually and in small groups without supervisors present. These conversations were candid, honest, and direct. In addition, the team received extensive briefings from each of the services, re-

viewed hundreds of documents, and reviewed the findings of the previous reviews and reports.

We also received extensive support from the historians of the Air Force Global Strike and other Commands, who provided a wealth of valuable historical documents dating back to the earliest days of the Air Force Nuclear Enterprise.

We found that in spite of the various shortcomings in the enterprise, the men and women of the nuclear enterprise are dedicated and committed to the mission, and work exceedingly hard to ensure the safety and security of the United States.

Our review focused on current operational issues of the DOD nuclear enterprise and what is needed to sustain the force until the various elements of the Triad are replaced. We did not evaluate any of the replacement programs themselves other than to note that it will be years before the new systems are fielded, and in the meantime, the existing systems must be maintained. Similarly the internal team did not review the nuclear warheads and the life extension programs being developed by the National Nuclear Security Administration to sustain them.

One of the most important findings of the internal review team was the realization that the problems of the nuclear enterprise do not exist in isolation. The problems are inextricably interrelated. One problem begets another which begets another. This interdependence between and among the shortfalls and deficiencies requires a coordinated, holistic approach to resolving the issues. The interdependent relationship of the problems identified within each Service, but particularly the Air Force, led to our conclusion that in many instances the ultimate solutions would have to be cultural and structural, and sustained over the long term. In other words, although money is needed to solve many of the problems, money is certainly not the only solution to the problems. And while there are many things that can and need to be fixed in the near term, the solutions in many instances are long-term.

For the most part, the findings of both the internal and external reviews were very much in line with one another. The external review team placed greater emphasis on the Office of the Secretary of Defense (OSD) while the internal review team focused primarily on the Services. There were also some differences in the recommendations and approach to addressing the problems, but in the end it is up to OSD and the Services ultimately to identify appropriate changes and put them into place.

The key recommendations contained in the internal review teams report are:

- Allow leaders to learn from mistakes;
- Provide the necessary manning and skills and address skill level gaps throughout the forces;
- Develop nuclear professionals and the career management to develop a broad nuclear career field;
- Overhaul the nuclear inspections process and reinforce distinctions between inspections, reviews, technical assistance, and exercises;
- Develop and use a rigorous self-assessment program to highlight and fix problems at all levels of command;
- Simplify administration of the personnel reliability program;
- Provide long-term sustainment and plan for parts obsolescence;
- Ensure future investments include Navy shipyard and shore installations and new facilities needed by the Air Force, including support and alert facilities;
- Direct the Air Force to upgrade Air Force Global Strike Command to a 4-star command
- Increase Air Force Global Strike Command, Navy Strategic Systems Programs, and Naval Reactors oversight and say in essential support functions;
- Direct the Air Force to upgrade Headquarters Air Force A–10 position to a 3-star position
- Create a senior position reporting to the Secretary for oversight of the Nuclear Enterprise.

CONCLUSION

Although not directly involved in the DOD's efforts to address the conclusions of the review teams and to implement the recommendations to address the problems in the enterprise, I am aware that much is being done to bring change to the nuclear enterprise. I also want to thank former Secretary of Defense Hagel for taking the initiative and providing the support to identify and resolve the problems that have been ongoing in the nuclear enterprise for many years. As one Air Force NCO said to our team, "There have been a lot of studies, but nothing ever changes. We want this study to be worth it this time."

SUMMARY OF DOD INTERNAL NUCLEAR ENTERPRISE REVIEW

Earlier this year, after a series of missteps involving the nation's nuclear deterrent forces and their senior leadership, Secretary Hagel directed both an internal Department of Defense (DOD) review and an external, independent review of the DOD nuclear enterprise. This includes Air Force Intercontinental Ballistic Missiles (ICBMs), nuclear-capable bombers and tactical fighters, Navy ballistic missile submarines, and the supporting infrastructure to build, maintain, and control these assets. The internal review led by then-Assistant Secretary of Defense Madelyn Creedon, Rear Admiral Peter Fanta formerly from the Joint Staff, and Command Sergeant Major Patrick Alston from U.S. Strategic Command. The external review was led by former Air Force Chief of Staff and Commander of Strategic Air Command, General Larry Welch (retired), and former Commander of Fleet Forces Command, Admiral John Harvey (retired).

The review leaders and their staffs visited all of the operational U.S. nuclear bases and key supporting facilities. They interviewed more than a thousand officers, enlisted personnel, civilians, and contractors from across the armed services. Both review teams found participants that were open, candid, and eager to engage in dialogue regarding their ability to perform their mission.

The internal review was specifically asked by the Secretary of Defense to examine the nuclear mission regarding personnel, training, testing, command oversight, mission performance, and investment. This review also looked into mission readiness and other operational issues and therefore remains classified. The internal report is consistent with the findings and conclusions of the external review.

The internal review disclosed systemic problems across the nuclear enterprise. In general, these problems can be divided into several categories: longstanding, known problems that remained unaddressed and so became, over time, under-reported; known problems that were addressed but the corrective actions made the problem worse (or created new problems); and problems that were common knowledge in the field but which were never communicated to leadership. Significantly, the review determined that many of these problems were inextricably interrelated, with one problem begetting another. While many issues will need additional investments, in many cases the necessary corrective actions are cultural and structural. These measures will take time to implement, and must also be sustained over the long-term.

The review provided a number of recommendations for both short- and long-term action; some are service-specific, some are at the departmental level and others are relevant to the entire enterprise. The review team made clear that this essential mission requires refocused attention and resources at all levels of the Department. The review organized its inquiry, findings, and recommendations into four categories: personnel, inspections, investment, and organization.

- The review of *personnel* issues identified issues with accountability, manning and skills mix, career development, morale and recognition, the personnel reliability program, and security forces. Within these areas, some issues manifested at the departmental level, in both services, or in a specific service. Key findings include:
  - A blurring of the lines between accountability and perfection in the Air Force;
  - Inadequate facilities and equipment, including IT systems, for the civilian workforce;
  - A rapidly aging civilian workforce in Navy shipyards, with a significant mid-career gap;
  - Lack of promotion opportunities generally in the nuclear career field and lack of a defined, sustainable career path for nuclear officers in Air Force, and career constraints resulting from nuclear specialization for both officers and enlisted personnel;
  - Stress on submarine crews created by shipyard shortfalls in the Navy;
  - Unduly burdensome, overly technical, and excessively risk-averse implementation of the personnel reliability program.
- The internal review's inquiry into *inspections* found that the nuclear enterprise is subject to a culture of excessive inspections. The problem is particularly acute in the Air Force, in part owing to the relative scope of inspections (a submarine inspection involves 180 sailors, a missile wing inspection involves ~4,000 airmen) and in part owing to important cultural differences between the services; in particular, the demand for perfection and lack of a meaningful self-assessment program.
- Regarding *investment,* the review surveyed an aging nuclear enterprise with a focus on sustainment, operations and maintenance (O&M) funding, and infrastructure issues. The review determined that as this infrastructure continues to

age, sustainment will become increasingly more difficult, time-consuming and expensive. Findings included:
- The lack of "weapon system" approach to the ICBM force, leading to disparate and inefficient sustainment and investment decisions for different system components;
- Component issues resulting from an aging, unique, and (relative to other weapons programs) small-sized, programs and systems;
- Serious shortfalls in basic O&M requirements; and
- Shipyard inefficiency caused by use of obsolete and/or temporary facilities.

• Finally, looking at the *organization* of the nuclear enterprise, the internal review echoed the finding of the external review regarding the absence, at the departmental level, of an integrated "nuclear enterprise." This absence led to reduced awareness of issues in the nuclear field, particularly those issues that cut across individual stovepipes.

Collectively, the internal and external reviews found a nuclear workforce that was dedicated, capable, and performing well in spite of challenges resulting from being understaffed, underresourced, and reliant on an aging and fragile supporting infrastructure in an over-inspected and overly risk-averse environment. Both reports identified serious issues with potential real world consequences if not addressed—some of which require long term and permanent cultural and structural changes.

As a result of these reports, the Department is undertaking a comprehensive effort to revitalize and integrate the nuclear enterprise. As long as the need for effective U.S. nuclear deterrence endures, the United States must operate its nuclear forces with world-class professionalism, ensure its plans and capabilities are tailored to emerging nuclear threats, and retain the human capital and infrastructure to adapt as the strategic landscape changes. The Department is using this opportunity to refocus attention and resources to continue to ensure the safety, security and effectiveness of our nuclear enterprise.

Senator SESSIONS [presiding]. Dr. Brumer?

STATEMENT OF DR. YISROEL E. BRUMER, DIRECTOR, STRATEGIC, DEFENSIVE AND SPACE PROGRAMS, OFFICE OF THE SECRETARY OF DEFENSE, COST ASSESSMENT AND PROGRAM EVALUATION

Dr. BRUMER. Chairman Sessions, Ranking Member Donnelly, and distinguished members of the committee, I am honored to be here today. I appreciate the opportunity to testify about how my team is executing tasks resulting from these recent internal and external nuclear enterprise reviews.

These reviews concluded that without intervention, issues related to resourcing, personnel, organization, and culture put the nuclear enterprise on a path to more frequent and greater problems than we have previously witnessed.

Former Secretary Hagel directed the Department to place a renewed emphasis on the nuclear force. He specifically charged the Director of Cost Assessment and Program Evaluation to track, monitor, and independently assess the implementation of the reviews' recommendations with particular focus on assessing the health of the nuclear enterprise. He also tasked us to provide monthly updates to the Deputy Secretary of Defense and regular updates to the Secretary.

Our eight-member team includes active duty ICBM and ballistic missile submarine military officers, as well as scientists and data experts to support technical assessments. This team has shown unwavering dedication to improving the enterprise by delivering the most honest and objective analysis of data on assessment as possible. Senior leadership has been keenly interested in comprehensive and sustainable solutions rather than short-term efforts that

merely check boxes without placing the enterprise on a more solid footing.

This charge has proven to be both the most important and the most difficult aspect of our task. It is easy to verify that an instruction has been modified to relieve the force of an unnecessary burden or that needed equipment and gear has been delivered. It is much more difficult to measure changes in culture or personal attitudes towards the mission. We believe this kind of analysis is important to facilitate real change while also remaining vigilant to identify unintended second- and third-order effects.

Our team has made significant strides in a short time. Since September, we have distilled every possible recommendation from the reviews. We have held meetings with all the stakeholders and formulated problem statements identifying the root causes of each issue. We have worked with each responsible organization to develop detailed approaches and milestones. Finally, to go beyond box checking, we developed metrics to determine whether we are achieving the desired intent to improve the overall health of the enterprise. Additionally, we are visiting key locations to become more familiar with the unique mission and quality-of-life challenges, as well as hold non-attributional discussions to gather empirical data on knowing what issues are most pressing.

Assessing the overall health will prove challenging, and we do recognize it will take years of dedicated efforts to restore the risk margin that has been lost. We intend to provide leadership with our best analysis and advice to help them guide these efforts to completion. Our team has embraced this challenge, and we are proud to have been entrusted with the role of ensuring issues are addressed to provide the Nation with a safe, secure, and effective strategic deterrent that is so critical to our National security.

I will continue to report our progress to this committee on a regular basis. You have my assurance that we will remain vigilant and we will maintain our honesty and integrity for as long as the Secretary of Defense and this committee deem our services worthy and necessary.

I thank you for your time, and I do welcome your questions.

[The prepared statement of Dr. Brumer follows:]

PREPARED STATEMENT BY DR. YISROEL BRUMER

INTRODUCTION

Mr. Chairman and distinguished members of the subcommittee, I am honored to join you today. I appreciate the opportunity to testify about how my team is executing the Secretary of Defense's direction to track, monitor, and independently assess the implementation of recommendations from recent internal and external reviews of the Nuclear Enterprise and to support efforts to ensure the viability of our Nation's strategic deterrence in the 21st century.

In February 2014, former Secretary Hagel directed both internal and external reviews of the entire Nuclear Enterprise. These reviews were conducted over the course of several months by highly esteemed nuclear professionals, including civilians as well as active duty and retired military. The review teams conducted hundreds of field interviews with individuals whose experiences spanned the Nuclear Enterprise, from first-term airmen, sailors, and marines to the most senior commanders. Both reviews concluded that without intervention, issues related to resourcing, personnel, organization, and culture have the Nuclear Enterprise on a path to more frequent and greater problems than we have previously witnessed.

As you are aware, these were not the first studies detailing the shortfalls within the Nuclear Enterprise, and several had noted very similar, if not identical, find-

ings. With that in mind, the Secretary of Defense directed that the Department must place a renewed emphasis on improving the health of the nuclear force.

To enhance senior leader visibility and ensure effective implementation that addresses root causes, Secretary Hagel directed the Director of Cost Assessment and Program Evaluation (CAPE), with the support of the Joint Staff, Air Force, Navy, the Office of the Secretary of Defense, and U.S. Strategic Command, to:

(1) Track, monitor, and independently assess the implementation of the reviews' recommendations.
(2) Conduct analysis to determine if corrective actions are having the desired effect and yield long-term sustainable solutions.
(3) Assess the health of the nuclear enterprise.
(4) Provide monthly updates to the Deputy Secretary of Defense.
(5) Provide quarterly updates to the Secretary of Defense.

My division within CAPE is charged with this task because our portfolio includes program assessment and evaluation of the Nuclear Enterprise.

In his tasking letter to CAPE, Secretary Hagel directed the Military Departments and other DOD components to provide CAPE everything necessary to conduct robust, complete, rigorous, and timely assessments. I am pleased to report we now have nuclear-specialized representatives from the Air Force, Navy, and STRATCOM on our team. Additionally, we have been granted access to the Joint Staff, STRATCOM, and Service agencies to gather pertinent data to meet the Secretary's charge of robust, complete, rigorous, and timely assessment.

Our eight-member team includes Active Duty military officers that have served in the ICBM and ballistic missile submarine career fields, as well as scientists and data experts to support technical assessments. Additionally, we utilize a contractor team to conduct deep dive data analyses and leverage subject matter expertise. The diversity of the team, including expertise in nuclear operations, social science, data analysis, and more, has provided a broad understanding of the reviews' recommendations so we can properly assess the wide range of subjects brought forward. I am extremely proud of the team, which has been willing to put in the intensity and the hours necessary to do the job right. They have shown unwavering dedication to improving the Nuclear Enterprise by delivering the most honest and objective analysis, data, and assessments possible.

BEYOND BOX CHECKING

Department of Defense (DOD) senior leadership has been very clear that the Secretary was keenly interested in comprehensive and sustainable solutions, rather than short-term efforts that merely meet recommendations by checking boxes without placing the enterprise on more solid footing. The Secretary charged our team to go beyond ensuring that tasks are completed and to answer questions like "Are DOD efforts having the intended effect?", "Are unanticipated risks arising?" and most critically, "Is the Nuclear Enterprise getting healthier?"

This charge has proven to be both the most important and most difficult aspect of our task. It is comparatively easy to verify that an instruction has been modified to relieve the nuclear force of an unnecessary burden or that needed equipment and gear has been delivered to the force. It is much more difficult to measure changes in culture or personal attitudes toward the mission. For this reason, we added a social scientist to the team and have leveraged the expertise of the Defense Equal Opportunity Management Institute, which conducts surveys of the command climate in units across all the Services, to help us gather the pertinent data for accurate assessments of the overall health of the Nuclear Enterprise. Additionally, we remain vigilant to identify unintended second- and third-order effects of changes driven by the recommendations.

We have also initiated efforts to ensure that we are capable of independently verifying the accuracy of the reports we are receiving, without becoming another inspection agency that places an additional burden on the force. We are gathering a broad array of data and are creating relationships with key agencies to obtain on-the-ground data from existing inspections to support our assessments. Lastly, we plan to regularly interact with forces in the field at all ranks, on a non-attribution basis, to better understand the challenges they are facing and the changes they are seeing.

PROGRESS TO DATE

I am proud to report to this Committee that our team has made significant strides in a short time. Since September, we have combed every possible recommendation from the two reviews, nearly 200 in all. We held meetings with all stakeholders and formulated problem statements in an effort to identify the root cause of each issue.

We worked with each responsible organization to develop detailed approaches to correct the root problems. Finally, metrics and milestones were developed to provide mechanisms for moving the various efforts forward and for assessing their effects. In keeping with the spirit of the task to go "beyond box checking," the team developed both process metrics to determine whether a particular task is completed, as well as outcome metrics to assess whether the cumulative effects of the tasks are achieving the desired intent of the recommendations and improving the overall health of the Enterprise.

In line with the Secretary's charge for complete, rigorous, and timely assessment, the CAPE Director and our team has visited and will continue to visit key Nuclear Enterprise locations. During these visits, the team becomes more familiar with the unique mission and quality-of-life challenges of that particular location. Additionally, the team holds individual and group non-attributional discussions to gather empirical data to determine what issues are most pressing to those individuals or groups, and solicits feedback on whether personnel in the field think our metrics are appropriate for tracking the health of the Enterprise.

As stated earlier, we recognize the outcome metrics will be the most challenging to assess. We also recognize these are the most challenging for those in the field to execute, and it will take years of dedicated efforts to restore the risk margin that has been lost. We intend to provide leadership with our best analysis and advice to help them guide these efforts to completion.

CONCLUSION

The DOD leadership, from Secretary Carter on down, has been clear that the nuclear enterprise—and the deterrent effect it provides—is a high priority and will remain so as long as nuclear weapons exist. My team has embraced that challenge and they are proud to have been entrusted with the role of ensuring appropriate resourcing, personnel, organizational, and policy issues are addressed to provide the Nation with the safe, secure, and effective strategic deterrent that is so critical to our national security. The CAPE team will continue to report our progress to this committee on a regular basis. You have our assurance that we will remain vigilant and will maintain our reputation for rigor, honesty, and integrity in this important mission.

Senator SESSIONS. Admiral Benedict?

STATEMENT OF VADM TERRY J. BENEDICT, USN, DIRECTOR, STRATEGIC SYSTEMS PROGRAMS

Admiral BENEDICT. Yes, sir. Chairman Sessions, Ranking Member Donnelly, distinguished members of the committee, thank you for the opportunity to testify before the Subcommittee on Strategic Forces.

I represent the men and women of the Navy's Strategic Systems Programs (SSP).

Your continued support of our deterrence mission is appreciated, and I thank you for that.

My mission as the Director of Strategic Systems Programs is to design, develop, produce, support, and ensure the safety and security of our Navy's sea-based strategic deterrent capability, the Trident III (D5) strategic weapon system.

My written statement, which I respectfully request be submitted for the record, addresses all of my top priorities. Due to time constraints, I would like to briefly address three: nuclear weapons safety and security, the Trident II (D5) life extension efforts, and the solid rocket motor industry.

First, my top priority is the safety and security of our Navy's nuclear weapons. Custody and accountability of the nuclear assets entrusted to the Navy are the cornerstone of this program. Our approach to the nuclear weapons mission is to maintain a culture of excellence and self-assessment that produces the highest standards of performance and integrity.

Second, the Navy is proactively taking steps to address aging and technology obsolescence. SSP is life-extending the Trident II (D5) SWS strategic weapon system to match the *Ohio*-class submarine service life and to serve as the initial baseline mission payload for the Ohio replacement submarine platform. This is being accomplished through a life extension program for all of the Trident II (D5) subsystems, to include launcher, navigation, fire control, guidance, missile, and reentry.

Finally, I remain concerned with the decline in demand for the solid rocket motor industry. While the Navy is maintaining a continuous production of solid rocket motors, the demand for both National Aeronautics and Space Administration (NASA) and the Air Force has declined. This has put the entire specialized industry at risk. While the efforts of our industry partners and others have created short-term relief, a long-term support of the solid rocket motor industry remains a national problem.

Thank you for the opportunity to testify today, and I am pleased to answer any of your questions, sir.

[The prepared statement of Admiral Benedict follows:]

PREPARED STATEMENT BY VADM TERRY BENEDICT, USN

INTRODUCTION

Chairman Sessions, Ranking Member Donnelly, distinguished members of the subcommittee, thank you for this opportunity to discuss the Navy's strategic programs. It is an honor to testify before you this afternoon representing the Navy's Strategic Systems Programs (SSP).

SSP's mission is to design, develop, produce, support, and ensure the safety of our Navy's sea-based strategic deterrent, the Trident II (D5) Strategic Weapons System (SWS). The men and women of SSP and our industry partners remain dedicated to supporting the mission of our Sailors on strategic deterrent patrol and our marines, sailors, and coast guardsmen who are standing the watch, ensuring the security of the weapons we are entrusted with by this nation.

The Navy provides the most survivable leg of the U.S. nuclear triad with our ballistic missile submarines (SSBNs) and the Trident II (D5) SWS. A number of factors have contributed to an increased reliance on the sea-based leg of the triad. The 2010 Nuclear Posture Review reinforced the importance of SSBNs and the Submarine Launched Ballistic Missiles (SLBMs) they carry. SLBMs will comprise a significant majority of the Nation's operationally deployed nuclear warheads, thus increasing the Nation's reliance on the sea-based leg of the nuclear triad. The Chief of Naval Operations (CNO) and Vice Chief of Naval Operations have recently testified that the Navy's number one priority is to maintain a credible, modern, and survivable sea-based strategic deterrent. Maintaining our Nation's capability in this key mission area includes the proper funding of the *Ohio* Replacement Program—along with the propulsion and the SWS—it is "The Navy's #1 acquisition program."

Ensuring sustainment of the sea-based strategic deterrent capability is a vital national requirement today and into the foreseeable future. Our PB–16 budget request provides required funding to support the program of record in fiscal year 2016 for the Trident II (D5) SWS. To sustain this capability, I am focusing on my top priorities: Nuclear Weapons Safety and Security; the Trident II (D5) SWS Life Extension Program; the *Ohio* Replacement Program; the Solid Rocket Motor (SRM) Industrial Base; the implementation of the Nuclear Enterprise Review recommendations; the newly codified Navy Nuclear Regulatory responsibility; and Collaboration with the Air Force.

NUCLEAR WEAPONS SAFETY AND SECURITY

The first priority, and the most important, is the safety and security of the Navy's nuclear weapons. Accordingly, Navy leadership clearly delegated and defined SSP's role as the program manager and technical authority for the Navy's nuclear weapons and nuclear weapons security.

At its most basic level, this priority is the physical security of one of our Nation's most valuable assets. Our Marines and Navy Masters at Arms provide an effective

and integrated elite security force at our two Strategic Weapons Facilities and Waterfront Restricted Areas in Kings Bay, GA, and Bangor, WA. U.S. Coast Guard Maritime Force Protection Units have been commissioned at both facilities to protect our submarines as they transit to and from their dive points. These Coast Guardsmen and the vessels they man provide a security umbrella for our *Ohio*-class submarines. Together, the Navy, Marine Corps, and Coast Guard team form the foundation of our Nuclear Weapons Security Program, and my headquarters staff ensures that our nuclear weapons capable activities continuously meet or exceed security, safety, and compliance criteria.

SSP's efforts to sustain the safety and improve the security of these national assets continue at all levels of the organization. The Navy's nuclear weapons enterprise maintains a culture of self-assessment in order to sustain safety and security. This is accomplished through biannual assessments by SSP headquarters staff, periodic technical evaluations, formal inspections, and continuous on-site monitoring and reporting at the Strategic Weapons Facilities. Technical evaluations, formal inspections, and on-site monitoring at the Strategic Weapons Facilities provide periodic and day-to-day assessment and oversight. Biannual assessments evaluate the ability of the organization to self-assess the execution of the assigned strategic weapons mission and compliance with requirements. The assessments leverage information gained from these oversight activities. The results of these biannual assessments are critically and independently reviewed through the Navy Nuclear Weapons Assessment and provided to the Secretary of the Navy and the CNO.

We also strive to maintain a culture of excellence to achieve the highest standards of performance and integrity for personnel supporting the strategic deterrent mission. We continue to focus on the custody and accountability of the nuclear assets that have been entrusted to the Navy. SSP's number one priority is to maintain a safe, secure, and effective strategic deterrent.

D5 LIFE EXTENSION PROGRAM

The next priority is SSP's life extension efforts to ensure the Trident II (D5) SWS remains an effective and reliable sea-based deterrent. The Trident II (D5) SWS continues to demonstrate itself as a credible deterrent and exceeds the operational requirements established for the system over 30 years ago. The submarine leg of the U.S. strategic deterrent is ready, credible, and effective, thereby assuring our allies and partners and deterring potential adversaries. However, we must remain vigilant about age-related issues to ensure a continued high level of reliability.

The Trident II (D5) SWS has been deployed on our *Ohio*-class ballistic missile submarines for 25 years and is planned for a service life of 50 years. This is well beyond its original design life of 25 years and more than double the historical service life of any previous sea-based strategic deterrent system. As a result, effort will be required to sustain credible SWS from now until the end of the current *Ohio*-class SSBN in the 2040s, as well as the end of the service life of the *Ohio* Replacement SSBN in the 2080s.

The Navy is proactively taking steps to address aging and technology obsolescence. SSP is extending the life of the Trident II (D5) SWS to match the *Ohio*-class submarine service life and to serve as the initial baseline mission payload for the *Ohio* Replacement submarine platform. This is being accomplished through an update to all the Trident II (D5) SWS subsystems: launcher, navigation, fire control, guidance, missile, and reentry. Our flight hardware—missile and guidance—life extension efforts are designed to meet the same form, fit, and function of the original system to keep the deployed system as one homogeneous population, control costs, and sustain the demonstrated performance of the system. We will remain in continuous production of large energetic components such as solid rocket motors and Post Boost Control System Gas Generators, and are starting an age management replacement effort for missile small ordnance and control components. We have also started initial planning on the timing of when a follow-on to Trident II (D5) will be needed. These efforts will provide the Navy with the missiles and guidance systems we need to meet operational requirements through the introduction and deployment of the *Ohio* Replacement SSBNs through the 2080s.

While budgetary pressures and impacts of sequestration have resulted in some deferred or delayed efforts, strategic deterrence remains the Navy's highest priority. As such, the Navy is committed to minimizing, to the maximum extent possible, impacts to this program in order to meet strategic requirements.

One impacted effort is the change to our flight test program. In accordance with U.S. Strategic Command (STRATCOM) requirements, the Navy is required to flight test a minimum of four Trident II (D5) missiles per year in a tactically-representative environment. The purpose of flight testing is to detect any change in reliability

or accuracy. The fiscal year 2016 budget request reflects a reduction of one planned flight test for affordability. The Navy has coordinated with STRATCOM to determine that this temporary reduction is manageable in the short-term, contingent upon our plan to ramp back up to four flight tests per year later in the Future Years Defense Program (FYDP). A prolonged reduction beyond what is planned in fiscal year 2016 would impact our ability to detect changes in reliability and accuracy of an aging system with the required degree of statistical confidence to meet STRATCOM requirements. I am strongly committed to ensure our flight testing returns to four flight tests per year.

Despite budgetary pressures, the Navy's D5 life extension program remains on track. In June 2014, the USS *West Virginia* (SSBN 736) successfully conducted her Demonstration and Shakedown Operation (DASO 25) by launching two missiles. One missile marked the third flight test of the D5 life-extended (LE) guidance system and the second flight test of the D5 LE Command Sequencer. The second missile was the first flight of the D5 LE Flight Controls Electronics Assembly and Interlocks packages. Additionally, the first flight test of the D5 LE guidance system with the D5 LE Flight Controls Electronics Assembly and Interlocks packages is scheduled for DASO 26 in fiscal year 2016. The D5 LE Command Sequencer met its initial fleet introduction earlier this year. The life extension efforts for the remaining electronics packages are on budget and on schedule. The life-extended missiles will be available for initial fleet introduction in fiscal year 2017.

Another major step to ensure the continued sustainment of our SWS is the SSP Shipboard Integration (SSI) Programs, which address obsolescence management and modernization of SWS shipboard systems through the use of open architecture design and commercial off-the-shelf hardware and software. The first increment of this update was installed on the final U.S. SSBN in April of last year. This completed installation on all 14 U.S. SSBNs, all 4 UK SSBNs and all U.S. and U.K. land-based facilities. Subsequent increments of this program begin installation this summer. The SSI Program includes refreshes of shipboard electronics hardware and software upgrades, which will extend service life, enable more efficient and affordable future maintenance of the SWS and ensure we continue to provide the highest level of nuclear weapons safety and security for our deployed SSBNs while meeting STRATCOM requirements.

To sustain the Trident II (D5) SWS, SSP is extending the life of the W76 reentry system through a refurbishment program known as the W76–1. The W76–1 refurbishment maintains the military capability of the original W76 for an additional 30 years. This program, which is being executed in partnership with the Department of Energy, National Nuclear Security Administration (NNSA), has completed over 50 percent of the planned warhead production. The Navy will continue to work with NNSA to closely monitor production and deliveries to ensure there are no operational impacts.

In addition, the Navy continues the design work to refurbish the aging electronics in the W88 reentry system. The Navy is collaborating with the Air Force to reduce costs through shared subsystems suitable for the W88/Mk5 and the W87/Mk21. Additionally, the Nuclear Weapons Council (NWC) has approved the inclusion of conventional high explosive refurbishment as part of this effort which will support deployment of the W88/Mk5 into the early 2040s. As directed by the NWC, we have submitted funding requests to support the initial concept studies (6.2/6.2A) for an Interoperable Warhead (IW) to begin in 2020. The Navy believes that the NWC is effective at managing and identifying priorities for the nuclear weapons stockpile. Moreover, the Navy is fully represented at the NWC and has every opportunity to raise any issues directly with the NWC when necessary. Therefore, I do not recommend a separate Service vote at the NWC.

OHIO REPLACEMENT PROGRAM

The Navy's highest priority acquisition program is the *Ohio* Replacement Program, which replaces the existing *Ohio*-class submarines. The continued assurance of our sea-based strategic deterrent requires a credible SWS, as well as the development of the next class of ballistic missile submarines. The Navy is taking the necessary steps to ensure the *Ohio* Replacement SSBN is designed, built, delivered, and tested on time with the right capabilities at an affordable cost.

To lower development costs and leverage the proven reliability of the Trident II (D5) SWS, the *Ohio* replacement SSBN will enter service with the Trident II (D5) SWS and D5 LE missiles onboard. These D5 LE missiles will be shared with the existing *Ohio*-class submarine until the current *Ohio*-class retires. Maintaining one SWS during the transition to the *Ohio*-class replacement is beneficial from a cost, performance, and risk reduction standpoint. A program to support long-term SWS

requirements will have to be developed in the future to support the *Ohio*-class replacement SSBN through its entire service life.

The Navy continues to leverage from the *Virginia*-class program to implement lessons-learned and ensure the *Ohio* Replacement Program pursues affordability initiatives across design, construction, and life cycle operations and support. Several critical milestones and decisions were achieved by the SSBN design team as they progress the design of the *Ohio* Replacement. Maintaining the pace of design and submarine industrial capability is critical to the continued success of our sea-based strategic deterrent now and well into the 2080s.

A critical component of the *Ohio* Replacement Program is the development of a Common Missile Compartment (CMC) that will support Trident II (D5) deployment on both the *Ohio*-class replacement and the successor to the U.K. *Vanguard*-class. As the United Kingdom will be the first to test, launch, and deploy the Trident II (D5) system in a CMC, the U.S.-led design team is progressing at pace to support the U.K. Successor lead ship construction timeline. In 2014, the United States contracted for the first joint procurement of missile tubes to support building the U.S. prototype Quad-pack module, the Strategic Weapons System-Ashore (SWS Ashore) test site, and the U.K.'s first SSBN. The joint CMC effort is shifting from design to construction that will support production in both United States and United Kingdom build yards. Any delay to the common missile compartment effort has the potential to impact the U.K.'s ability to maintain a continuous at sea deterrent posture.

To manage and mitigate technical risk to both the U.S. and U.K. programs, SSP is leading the development of SWS Ashore integration test site at Cape Canaveral, FL. This is a joint effort with the Navy and the State of Florida investing in the redevelopment of a Polaris site to conduct integration testing and verification for *Ohio* replacement and U.K. Successor programs. Refurbishment of the Polaris site and construction of the infrastructure and building is proceeding at a rapid pace. Trident II (D5), *Ohio*-class, and *Ohio* replacement new design hardware will be co-located and integrated to prove the successful re-host and redeployment of the Trident II (D5) SWS on the new submarines. To mitigate the restart of launch system production, SSP recently broke ground on a surface launch facility at the Naval Air Station, China Lake, CA. This facility will prove that the launcher industrial base can replicate the performance of the *Ohio*-class Trident II (D5) launch system. We will be launching the refurbished Trident II (D5) test shapes we used in the 1980s starting in fiscal year 2017. Launch performance is a critical factor we must understand at the systems level to ensure we maintain high reliability as we transition the weapon system to the next class of SSBNs.

The United States and the United Kingdom have maintained a shared commitment to nuclear deterrence through the Polaris Sales Agreement since April 1963. As the Director of SSP, I am the U.S. Project Officer for the Polaris Sales Agreement. Our programs are tightly coupled both programmatically and technically to ensure we are providing the most cost effective, technically capable nuclear strategic deterrent for both nations. Last year, marked the 51st anniversary of this agreement, and I am pleased to report that our longstanding partnership with the United Kingdom remains strong. The United States will continue to maintain its strong strategic relationship with the United Kingdom as we execute our Trident II (D5) LE Program and develop the common missile compartment. Our continued stewardship of the Trident II (D5) SWS is necessary to ensure a credible and reliable SWS is deployed today on our *Ohio*-class submarines, the U.K. *Vanguard*-class, as well as in the future on our respective follow-on platforms. This is of particular importance as the New START treaty reductions are implemented, increasing the reliance on the sea-based leg of the Triad. The *Ohio* replacement will be a strategic, national asset whose endurance and stealth will enable the Navy to provide continuous, uninterrupted strategic deterrence well into the 2080s.

SOLID ROCKET MOTOR (SRM) INDUSTRIAL BASE

A priority is the importance of the defense and aerospace industrial base, in particular, the solid rocket motor industry. I remain concerned with the decline in demand for solid rocket motors. While the Navy is maintaining a continuous production capability at a minimum sustaining rate of 12 rocket motor sets per year, the demand from both NASA and Air Force has precipitously declined. Not only did this decline result in higher costs for the Navy, as practically a sole customer, but it also put an entire specialized industry at risk for extinction—or at least on the "endangered species list." To allow this puts our National security at risk. The Navy cannot afford to singularly carry this cost, nor can our Nation afford to lose this capability. While the efforts of our industry partners and others have created short-term cost

relief, the long-term support of the solid rocket motor industry remains an issue that must be addressed at the national level. To date, this has not happened. At SSP, we will continue to work with our industry partners, DOD, senior NASA leadership, Air Force and Congress to do everything we can to ensure this vital national security industry asset is preserved.

NUCLEAR ENTERPRISE REVIEW

The recent Secretary of Defense-directed Nuclear Enterprise Review (NER) and the Program and Budget Review for the fiscal year 2016 budget formulation focused significant attention on the recapitalization, sustainment, and modernization of our nuclear deterrence systems and infrastructure. The NER provided the Navy a thorough and unbiased look at our nuclear forces. Overall, the report found that the nuclear enterprise is safe, secure, and effective today but it also found evidence of systemic problems that, if not addressed, could undermine the safety, security, and effectiveness of elements of the force in the future. Fortunately the Navy's internal Nuclear Weapons Assessment and the SSP Comprehensive Self-Assessment identified most of the issues underscored during the NER. In fact, the report validated numerous efforts already underway.

The Navy has taken active steps to address the more than 68 recommendations with Navy equity contained in the report. Significant action has been taken to implement each recommendation, generally focused on a few key areas, including: oversight, investment, and personnel and training improvements. These implementation actions have been funded with an additional budget request of $407 million in fiscal year 2016 and $2.2 billion across the FYDP. With respect to oversight, the Navy is clarifying the nuclear deterrent enterprise leadership structure and reducing administrative burdens imposed on the forces. The Nuclear Deterrent Enterprise Group (NDERG), formed and led by the Secretary of Defense will provide regular oversight of the nuclear enterprise. The Navy Nuclear Weapons Oversight Council has become the Navy's mechanism to ensure NDERG recommendations and guidance are properly implemented and that investments achieve the intended effect.

Regarding training and personnel the Navy is planning a significant investment to build a margin in the deterrence force and clear the SSBN maintenance backlog. Some of the recommendations involve long-term cultural or organizational changes, and the Navy has matched the right responsibilities with the right leaders. There will be an emphasis on the importance of the deterrence mission through updated vision statements, revised campaign plans, and methods to eliminate obstacles to enhance moral conduct and relieve the pressures on sailors, training, and work-life balance. More specifically the Navy will apply additional resources to Strategic Mission personnel with a planned $28 million and an increase of 44 Full-Time Equivalents (FTE) in fiscal year 2016. In addition 160 FTEs were added for the Strategic Weapons Facilities and Trident Training Facility to improve sustainment and training of the ballistic missile submarine force.

The Navy has also planned a substantial increase in FTEs for the four Naval Public Shipyards. With an eventual target of 33,500 direct and reimbursable FTEs, the goal is to better match capacity with workload. In addition, some submarine maintenance will be outsourced to the private sector to ensure over capacity work does not result in deferred maintenance into the FYDP. Both of these actions result in an investment of $338 million with an overall planned FYDP investment of $1.1 billion. There will be accelerated infrastructure improvements and recapitalization plans to ensure long-term sustainment at Shipyards and Strategic Weapons Facilities. The Navy accelerated investment in the budget request for fiscal year 2016 from a 17 year plan to a 15 year plan to improve the condition of the Shipyards by adding $350 million across the FYDP. The Navy has also funded $324 million across the FYDP to address infrastructure issues at the Strategic Weapons Facilities. Navy is developing a 20 year investment plan to ensure the continued reliability of critical infrastructure at these facilities to support nuclear weapons movement and operations. While the Navy has made significant progress through actions taken to date, we recognize much work remains to be accomplished. The Navy is confident we have the right emphasis, oversight, and processes in place to maintain a credible, modern, and safe sea-based deterrent.

NAVY NUCLEAR REGULATORY RESPONSIBILITY

As a result of the Nuclear Enterprise Review the Navy implemented a centralized regulatory authority for nuclear force readiness. As the Director, Strategic Systems Programs (DIRSSP), I now have accountability, responsibility and authority to serve as the single Flag Officer to monitor performance and conduct end-to-end assessment of the Navy Nuclear Deterrence Mission (NNDM) elements. These responsibil-

ities are defined in Secretary of the Navy Instruction 8120.1B and Office of the Chief of Naval Operations Instruction 8120.1. Nine Echelon 2 level commands directly contribute to the NNDM: U.S. Fleet Forces Command, U.S. Pacific Fleet, Fleet Cyber Command, Navy Supply Systems Command, Naval Sea Systems Command, Chief of Naval Personnel, Bureau of Medicine and Surgery, Commander, Navy Installations Command, and SSP.

DIRSSP will be the NNDM regulatory authority responsible for assessing and reporting issues to the Navy Nuclear Weapons Council and the CNO. SSP is tasked with developing, coordinating, and implementing policies approved by the CNO, and conducting end-to-end assessments of the Department of the Navy nuclear weapons and nuclear weapons systems and personnel for safe, reliable, and effective execution of the NNDM.

SSP is engaged with the Echelon 2 commands defined above to understand their current reporting and assessment processes and to define the NNDM regulatory assessment policy. My next in-progress review for the CNO, April 2015, will define the existing reporting and engagement strategies, the status of our interaction with the commands, and present the initial component assessment and reporting.

COLLABORATION WITH THE AIR FORCE

The final priority is strategic collaboration between the Services. The Navy and the Air Force are both addressing the challenges of sustaining aging strategic weapon systems and have begun to work collaboratively to ensure these capabilities are retained in the long-term to meet our requirements. To do so, we are seeking opportunities to leverage technologies and make the best use of scarce resources.

As I testified last year, the Navy and the Air Force established an Executive Steering Group to identify and investigate potential collaboration opportunities and oversee collaborative investments for sustainment of our strategic systems. As a part of this effort, technology area working groups are studying collaboration opportunities in the areas of Reentry Systems, Guidance, Strategic Propulsion, Command and Control, Radiation Hardened Electronics, Testing and Surveillance, and Nuclear Weapons Surety.

The Navy was an active participant in the Air Force's Ground Based Strategic Deterrent (GBSD) effort. Members of my staff were involved with this effort, which began during the GBSD Analysis of Alternatives (AoA). Navy subject matter experts supported each of the GBSD AoA working groups and participated in an effort to evaluate the benefits and potential risks of commonality and collaboration for each of the GBSD AoA options. Since the completion of the AoA, the Navy has continued to support the Air Force technical and programmatic efforts on GBSD including technology identification and requirements development.

The benefits of increased collaboration between the services are many. However, commonality is required to actually save costs. Commonality will help improve the affordability of the Nation's strategic services by eliminating redundant efforts and by improving economic order quantities of key constituents and components. In addition to the benefits gained by improved economic order quantities, the use of common constituents and components will make it easier for the Navy and Air Force to sustain the critical skills and capabilities needed by stabilizing demand signals to suppliers. Finally these efforts allow the Navy and Air Force to leverage work already being done by the other Service to avoid unnecessary duplication and costs.

Each leg of the Triad has unique attributes. Furthermore, a sustained and ready Triad provides an effective hedge, allowing the Nation to shift to another leg, if necessary due to unforeseen technical problems or vulnerabilities. For this reason, the Department is focused on cooperative efforts that maintain affordability and reduces risk to both services while retaining essential diversity where needed to ensure a credible and reliable deterrent. Many of the industries and required engineering skills sets are unique to strategic systems. Key to SSP's historical success has been our technical applications programs, which in the past have provided a research and development foundation. As we evaluate maintaining this strategic capability until the 2080s to match the full service life of the *Ohio* Replacement submarine, we will need to resume these critical efforts.

CONCLUSION

SSP continues to maintain a safe, secure, and effective strategic deterrent and focus on the custody and accountability of the nuclear assets entrusted to the Navy. Our PB–16 budget request ensures that we will sustain this capability in fiscal year 2016. However, we must remain vigilant about unforeseen age-related issues to ensure the high reliability required of our SWS. SSP must maintain the engineering support and critical skills of our industry and government team to address any fu-

ture challenges with the current system as well as prepare for the future of the program. Our Nation's sea-based deterrent has been a critical component of our national security since the 1950s and must continue to assure our allies and deter potential adversaries well into the future. I am privileged to represent this unique organization as we work to serve the best interests of our great Nation.

Senator SESSIONS. Thank you.

General Wilson?

STATEMENT OF LT. GEN. STEPHEN W. WILSON, USAF, COMMANDER, AIR FORCE GLOBAL STRIKE COMMAND

General WILSON. Chairman Sessions, Ranking Member Donnelly, distinguished members of the committee, thank you for allowing me to appear before you and represent the men and women of Air Force Global Strike Command.

Let me first say that the airmen are doing an outstanding job every single day, providing a safe, secure, and effective nuclear force for our Nation while ensuring our conventional mission continues to excel.

The last time I testified before the committee, we had just experienced our unignorable moment when we discovered cheating at Mahlstrom Air Force Base. We have instituted major changes based on feedback from our airmen doing the mission and are constantly assessing whether and where we still need to improve.

One of the most important changes we have instituted is empowering our people, not micro-managing them. Through their innovation, hard work, and shared commitment, they are able to truly create their own future and to write their own story.

These changes we are undertaking are completely in line with both the internal and external nuclear enterprise reviews. With the support of the senior leadership, we have restored the nuclear focus and are starting to fund essential modernization efforts.

Funding for the long-range strike bomber is critical to extending our dominance against next generation capabilities. The long-range standoff missile will improve our ability to strike heavily at defended targets. The ground-based strategic deterrent will provide the responsive capability and the strategic stability on which this Nation has come to rely. We are also continuing our efforts to upgrade the NC3 systems that underpin our nuclear deterrent to ensure we receive presidential orders. We are working with our Navy partners to find areas of intelligent commonality where appropriate.

Mr. Chairman, I want to thank you for the opportunity to appear before the committee, and I look forward to your questions.

[The prepared statement of General Wilson follows:]

PREPARED STATEMENT BY LT. GEN. STEPHEN W. WILSON, USAF

INTRODUCTION

Chairman Sessions, Ranking Member Donnelly, and distinguished members of the subcommittee; thank you for allowing me to represent the over 23,000 Air Force Global Strike Command (AFGSC) airmen. I will use this opportunity to update you on our mission, the status of our forces, and the future of the command.

AIR FORCE GLOBAL STRIKE COMMAND MISSION

In an effort to re-invigorate the nuclear enterprise, the Air Force re-activated Strategic Air Command and re-designated the organization as Air Force Global

Strike Command. Last year AFGSC celebrated its fifth anniversary. As you know, the command was created to provide a focus on the stewardship and operation of two legs of our Nation's nuclear triad while also accomplishing the conventional global strike mission. Numerous Blue Ribbon panels, task forces, and other reviews have reaffirmed that a triad should be maintained under the New START agreement with the Russian Federation. Other nations' nuclear arsenal advancements and modernization efforts are a national concern and validate the fact that AFGSC's Nuclear Deterrence Operations mission set remains critical in today's unstable geopolitical environment. We live in a world that continues to rapidly change and until we have the peace and security of a world without nuclear weapons we must never forget the stabilizing influence the triad has on our allies, partners, and adversaries. In order for us to be effective across the spectrum of conflict from day-to-day deterrence and assurance operations to nuclear engagement, our airmen must be ready and equipped with the right tools to do the job. The world has not experienced a war between major super powers for over 70 years; there are a number of reasons for this, one of which is our Nation has provided credible deterrence for our adversaries and assurance for allies and partners. Due to the special trust and confidence the American people put in us every day, we can never fail them in ensuring a safe, secure, and effective nuclear arsenal. Continuing in the proud heritage of Strategic Air Command, yet tailored for today's evolving world, AFGSC's mission is to: "Develop and provide combat-ready forces for nuclear deterrence and global strike operations—Safe, Secure, and Effective—to support the President of the United States and combatant commanders."

Air Force Global Strike Command Nuclear Mission

At the core of our mission statement are three reinforcing, key attributes: "Safe-Secure-Effective." These were outlined in President Obama's 2009 Prague speech where he said: "Make no mistake: as long as these weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guarantee that defense to our allies." The attributes of "safe, secure, effective" serve to underpin every nuclear-related activity in AFGSC, from the discipline adhered to in the smallest task, to how we prioritize our planning and programming for the Future Years Defense Program (FYDP). The effects of our nuclear force, as outlined in the 2010 Nuclear Posture Review, are to ensure strategic stability, to support the regional deterrence architecture, and to assure our allies and partners.

Air Force Global Strike Command Conventional Mission

The command's focus on nuclear operations cannot come at the cost of our conventional mission. Our conventional bomber forces defend our national interests by deterring or, should deterrence fail, defeating an adversary. Two capabilities are fundamental to the success of our bomber forces: our ability to hold heavily defended targets at risk and our ability to apply persistent combat power across the spectrum of conflict anywhere on the globe at any time. The United States' fleet of heavy bombers provide the Nation a visible global warfighting capability that is essential to the credibility of America's national security strategy. These bombers carry our latest high-tech munitions in quantities to ensure the Air Force can meet our Nation's global responsibilities, and therefore are in high-demand by the regional combatant commanders.

CHALLENGES ANSWERED

It is no secret our nuclear forces have recently gone through a time of intense scrutiny, most notably with the cheating incident in our intercontinental ballistic missile (ICBM) community. However, we have turned this negative event into an opportunity for positive and lasting change. Remember, the bulk of our airmen are doing great work each and every day. They believe in the mission and are serving to the best of their abilities. Their faith in us deserves action; we have taken action to improve the two legs of the triad we operate. The challenge before us is to follow through on these actions.

Force Improvement Program

As you know, the Force Improvement Program (FIP) was directed in response to the aforementioned cheating incident. We knew we had to make changes, but instead of doing it the same way we always had in the past, we asked the airmen doing the job day in and day out what they would improve. They responded openly and thoroughly. Our bottom-up approach yielded 384 recommendations in the ICBM community and 215 recommendations in the bomber community. We approved action on 98 percent of the ICBM recommendations and 92 percent of the bomber recommendations.

Some of the changes are significant paradigm shifts for our ICBM community. We are completely changing ICBM crewmember progression to a "3+3" construct where our crewmembers can focus on becoming weapon system experts during their first three years and then transition to instructor, evaluator, or flight commander duties for the second three years. We have also put assistant Operations Officers in place in all of the operations squadrons to provide mid-career leadership so desperately needed. Lastly, we changed the testing and evaluation culture that was the root cause of many of the problems within the operations community. Instead of studying to get a perfect score for an exam, we have refocused our training and evaluation programs to reflect the mission at hand.

These changes are not just for the operations community, either. We are providing better tools and equipment to the maintainers. Our security forces members are getting new uniforms, cold weather gear, and weapons improvements—all commensurate with the important mission they do in harsh conditions protecting our Nation's most important assets. Another way we are showing our airmen the importance of the mission they perform is through increased pay. We now provide select officers Assignment Incentive Pay and critical enlisted members Special Duty Assignment Pay.

As mentioned earlier, it is important to note that FIP is not just an ICBM program. We applied the same construct to our bomber mission areas and we have multiple efforts ongoing to address issues raised. We are looking at our Continuous Bomber Presence (CBP) program to ensure we are manning the mission appropriately while providing stability for our airmen. Additionally, we are completely rewriting our qualification training syllabi to ensure quality nuclear training without losing focus on the conventional mission. With the Office of the Secretary of Defense's (OSD) help, we are revamping our implementation of the Personnel Reliability Program. We have refocused the program back to its original intent—a commander's program with an "up until down" mentality.

In order to ensure we do not lose this momentum, we are transitioning the idea of the Force Improvement Program to a continuous Force Improvement Philosophy. We will internalize the much-needed change we have gone through so that we can sustain these efforts to improve our Air Force nuclear forces. These changes are examples of us bridging the "Say-Do" gap that had become so pervasive in the nuclear enterprise. We continue to grow and shape our upcoming nuclear experts and leaders. We are focusing on developing a force of nuclear leaders who understand nuclear strategy and policy, and are capable of thoughtfully articulating what deterrence means in the 21st century. AFGSC is leading the way by integrating education and training at different points in a nuclear professional's career. We are utilizing expertise both within the Air Force and in industry to develop airmen with the skills necessary to lead and the knowledge necessary to effectively shape deterrence theory and policy.

Nuclear Enterprise Review Reports

This past November, the Department of Defense (DOD) released two different reports that analyzed the nuclear missions for areas of concern and improvement. The internal and external reports were extremely thorough, and I sincerely thank all those involved in helping to make our nuclear forces better. I will also add that we had already begun addressing almost all of the same issues. The reports' findings overlapped a majority of our existing FIP recommendations; we look forward to continuing the implementation of the recommended changes.

Senior Leader Support

There was a common thread throughout the last year with regard to the nuclear enterprise—senior leader support. We had neglected our nuclear forces for decades; our current leadership recognized this fact and moved decisively to correct that shortcoming. Even as we move to reduce the roles and missions of nuclear weapons in U.S. nuclear policy, nuclear weapons must remain effective and reliable. Former Secretary of Defense Hagel recognized this fact by saying, "Our nuclear deterrent plays a critical role in ensuring United States national security, and it's DOD's highest priority mission. No capability we have is more important." Secretary Carter said during his confirmation, " ... with respect to the nuclear enterprise, I have a long history in that regard and am a strong believer in a safe, secure and reliable nuclear arsenal for the United States." Our most senior leaders in both the DOD and Air Force have now made personal visits to all of our bases, not only showing support but also following up on the actions we are taking. Other ways we are seeing leaders take positive and lasting action are the funding increases and the follow through of the Nuclear Deterrence Enterprise Review Group chaired by the Sec-

retary of Defense. Senior leaders today recognize the importance of what our nuclear deterrence offers this nation and are committed to lasting, positive change.

AIR FORCE GLOBAL STRIKE COMMAND FORCES

Intercontinental Ballistic Missile Forces

Twentieth Air Force, one of two Numbered Air Forces (NAF) in AFGSC, is responsible for the Minuteman III (MM III) ICBM and our UH–1N helicopter forces. The 450 dispersed and hardened missile silos maintain strategic stability by presenting any potential adversary a near insurmountable obstacle should they consider a disarming attack on the United States. No potential adversary can hope to destroy this force without depleting their own arsenal. Every day over 900 airmen deploy to our 3 missile fields, executing effective deterrence and assurance operations. Accomplishing this vital mission demands we focus on sustaining our current systems while modernizing for the future.

Minuteman III

We continue efforts to sustain the Minuteman III ICBM. This includes upgrading the command, control, and communications systems and support equipment.

One of these support systems is the Transporter Erector (TE) Replacement Program (TERP). The TE is used to transport boosters and emplace them at the Launch Facilities (LF). The current fleet averages 23 years old and has experienced significant structural fatigue due to high mission tempo. We have completed the TERP design review and are preparing to prototype and test a new TE. We expect the new equipment to begin fielding in 2016.

We are also equipping ICBM launch control centers (LCC) with modernized communications systems that will upgrade or replace other aging and obsolete systems. The LCC Block Upgrade is an overall modification effort that replaces multiple LCC components to include a modern data storage replacement for floppy disks and new Voice Control Panels to provide high quality voice communications. We expect a contract to be awarded this year with production in 2018 and deployment in 2019. The Minuteman Minimum Essential Emergency Communications Network Program Upgrade will modernize and better secure the Emergency Action Message network; this upgrade will begin fielding early next year.

We conducted two MM III flight tests in fiscal year 2014 that, along with two Simulated Electronic Launch Minuteman tests in the operational environment of six LFs each, demonstrate the operational credibility of the nuclear deterrent force and the command's commitment to sustaining that capability. Operational flight testing is currently funded and planned for four operational test launches per year to satisfy requirements outlined by United States Strategic Command (STRATCOM) and the National Nuclear Security Administration (NNSA). In fact, I am pleased to report that last month we successfully test launched two ICBMs, both of which were the two longest MMIII flights in history. These special extended range missions have allowed us to gather important data and validate our global strike capability.

We continue to examine emerging technologies to ensure the MM III weapon system remains reliable and ready through 2030. Additionally, we are looking into how investments in these technologies can transfer to and provide savings for the future Ground Based Strategic Deterrent (GBSD) program.

Ground Based Strategic Deterrent

The Minuteman flight system, currently on its third model, has been on continuous alert since the early 1960s, over 50 years ago, and has proven its value in deterrence well beyond the platform's initial 10-year lifespan. All parts of the triad are complementary; the ICBM provides the most responsive portion of the triad. ICBM capability gaps were identified and validated by the Joint Requirements Oversight Council (JROC), and subsequently approved in August 2012 by the Air Force Chief of Staff, resulting in an Analysis of Alternatives (AoA). The AoA completed in June 2014 and identified a replacement to the MM III as the most cost-effective approach. Previously planned sustainment programs (e.g., guidance and propulsion replacement programs) will be leveraged into GBSD and serve as the foundation of the effort. Starting this summer, the Air Force's second Enterprise Capability Collaboration Team (ECCT) will assemble the resources, stakeholders, and expertise across the Air Force to identify ICBM program needs and gaps to determine the best command and control and other system requirements for GBSD. Additionally, we are engaged with our naval partners to further investigate areas for intelligent commonality between potential GBSD systems and future Navy weapons. We hope to find areas of overlap with the objective of reducing design, development, manufacturing, logistics support, production, and testing costs for the Nation's strategic sys-

tems while still acknowledging that the different weapon systems will always have some requirements that necessitate unique solutions.

Successful fielding of a follow-on ICBM will require the acquisition team to design the entire system beginning now through 2019. This approach provides flexible deployment options in light of budget constraints. Due to system age-out, the first priority is to replace the missile itself. However, command and control (C2) and infrastructure recapitalization is necessary to continue safe, secure, and effective operations. It is no small task to upgrade the command and control systems along with the underlying infrastructure that supports the weapon system. For example, at our largest missile field operated by the 341st Missile Wing, we must connect and support hardened systems across almost 14,000 square miles. As a comparison, this is larger than the entire state of Maryland; our nuclear command and control is currently serviced by copper wire and equipment installed in the 1960s. AFGSC is defining approaches to upgrade C2 and modernize necessary facilities. GBSD cannot be viewed as just another life extension to our existing MMIII; it is time to field a replacement ground-based capability that will assure our allies and deter potential adversaries well into the future. Thank you for your continued support of GBSD as we move forward ensuring it will lead to a viable replacement for the MM III ICBM.

UH–1N

AFGSC is the lead command for the Air Force's fleet of 62 UH–1N helicopters. The majority of these aircraft support two critical national missions: nuclear security in support of the ICBM force, and the Continuity of Operations/Continuity of Government mission in the National Capital Region. They also actively participate in the Defense Support of Civil Authorities program often being called to help with search and rescue activities.

Although the UH–1Ns are 45+ years old, we plan to fly them until the mid-2020s. We must sustain the helicopter's current capabilities while selectively upgrading the platform to address the most critical safety and operational concerns. Safety improvements currently underway include the procurement of crashworthy aircrew seats across the fleet and night vision goggle-compatible cockpits that will be fully integrated by 2016. In addition, the command is fielding the Helicopter Terrain Avoidance and Warning System and Traffic Collision Avoidance System to improve situational awareness and survivability. Finally, in order to more effectively employ the UH–1N in its nuclear security role, AFGSC stood up the 582d Helicopter Operations Group, the only helicopter operations group in the Air Force, at F.E. Warren Air Force Base (AFB), WY, to better support and focus our helicopter employment at the three missile wings.

UH–1N Follow On

While we can, to some extent, mitigate the UH–1N's deficiencies in range, speed, and payload, no amount of modification will close these critical capability gaps entirely. This can only be accomplished by fielding a replacement aircraft that meets validated mission requirements. As such, a UH–1N Replacement Program is included in the fiscal year 2016 budget submission. We are working with SAF/AQ and Air Force Materiel Command to confirm and select the most cost-effective way to procure a new platform. We look forward to identifying and procuring a replacement helicopter that fully meets our nuclear mission needs.

Dual-Capable Bomber Forces

Eighth Air Force is responsible for the B–52H Stratofortress (B–52) and B–2A Spirit (B–2) bombers. This includes maintaining the operational readiness of both the bombers' nuclear and conventional missions. The B–52 serves as the Nation's most versatile and diverse weapon system in Air Force Global Strike Command by providing precision and timely long range strike capabilities. Meanwhile, the B–2 can penetrate our adversary's most advanced Integrated Air Defenses Systems to strike heavily defended targets. Our flexible dual-capable bomber fleet is the most visible leg of the nuclear triad. They provide decision makers the ability to demonstrate resolve through generation, dispersal, or deployment, and the ability to quickly place bomber sorties on alert thereby ensuring their continued survival in support of the President and to meet combatant command requirements.

Global Assurance and Deterrence

CBP, initiated in 2003, increases regional stability and assures our allies and partners in the U.S. Pacific Command area of responsibility. CBP is an enduring requirement; therefore we have taken steps to reduce the cost of squadron rotations. Specifically, over the past year we worked closely with Pacific Air Forces on the requirement to establish a detachment at Andersen Air Force Base, Guam. This detachment will be made up of operations and maintenance experts and will better

enable us to support CBP operations. Through the Bomber Assurance and Deterrence program, we exercise with every combatant command and every joint partner annually. These exercises take place all over the world and are another example of the versatility AFGSC can provide in the conventional mission area.

B–52H

The B–52 may be the most universally recognized symbol of American airpower . . . its contributions to our national security through the Cold War, Vietnam, Desert Storm, Allied Force, Iraqi Freedom and Enduring Freedom are well documented. Our airmen have worked tirelessly to keep the venerable B–52 in the air. The B–52 is able to deliver a wide variety of nuclear and conventional weapons. This past year, we maintained complete coverage of our Nuclear Deterrence Operations requirements while supporting overseas CBP commitments.

AFGSC continues work toward completing the Combat Network Communications Technology (CONECT) upgrade. This upgrade resolves sustainability issues with cockpit displays and communications while also providing a "digital backbone" enabling integration into the complex battlespace of the future. Specifically, CONECT replaces aging displays, adds an additional radio, and provides beyond-line-of-sight communications and situational awareness with machine-to-machine retargeting. CONECT achieved approval for full rate production by 2016. We have accepted our first B–52 CONECT jet, and expect to achieve initial operational capability this July.

We are working on the 1760 Internal Weapons Bay Upgrade to the B–52's bomb bay that greatly improves flexibility and precision weapon capacity for all smart weapons. Configuring the aircraft to internally carry these smart weapons and the pathway for integration of the Joint Air to Surface Stand-Off Missile-Extended Range (JASSM–ER) will give the warfighter additional advantages over an adversary and will provide increased capability to our Joint Force Commanders. JASSM–ER, for instance, will provide an increase in weapons employment range, allowing our forces to posture themselves outside of threat areas thereby increasing both the aircraft and weapon's survivability. This upgrade improves the B–52's carrying capacity by 60 percent.

Our B–52s are still using 1960s radar technology. The radar is unreliable and will be less effective operationally in a future threat environment, especially if we expect this aircraft to operate for another 25 years. Without an improved radar system on the B–52 we will continue to increase risk of significant degradation in both conventional and nuclear mission areas. We are still in the study phase of the B–52 Radar Modernization Program. However, this is an important program that is absolutely required to bring the B–52 into the modern age; and is particularly vital when discussing B–52 viability through 2040.

B–2

For over 25 years, the B–2 has defended America as our most modern strategic deterrent. In each of our Nation's last four armed conflicts, the B–2 has led the way in combat. This is a direct result of the outstanding airmen who work to operate, maintain, and secure the aircraft. The B–2 is able to penetrate heavily defended enemy defenses and deliver a wide variety of nuclear and conventional weapons due to its long-range and stealth capability.

We will preserve and improve the B–2's capability to penetrate hostile airspace and hold any target at risk without subjecting the crew and aircraft to undetected threats. To do this, we secured JROC validation of the Defensive Management System-Modernization (DMS–M) Capabilities Development Document, which will allow the program to enter into the Engineering and Manufacturing Development phase to acquire a new system. This upgrade provides the B–2 aircrew with improved threat situational awareness and increased survivability by replacing the current DMS Threat Emitter Locator System and display system with modernized and sustainable systems capable of addressing advanced threats. This program will keep the B–2 viable in future anti-access environments. We also continue work on the Common Very Low Frequency Receiver (CVR) to permit aircrews to better receive strategic communication messages and the B–2 Flexible Strike Phase 1 that will allow for future weapon capability upgrades.

AFGSC continues to evolve B–2 conventional combat capability by fielding vital programs such as the Massive Ordnance Penetrator (MOP). Successful fielding of the 30,000-pound MOP bolstered our Nation's ability to hold hardened, deeply buried targets at risk. Flight testing of the MOP completed successfully and AFGSC will become the lead command for MOP sustainment starting next fiscal year. Additionally, we are still prototyping and testing the MOP dolly and rail system. Once complete, we will move to production and the dolly and rail system will increase

storage capacity and create more efficient handling of the MOP. We would like to thank Congress for your support on this critical program.

We are striving to maintain the proper balance of fleet sustainment efforts, testing, aircrew training, and combat readiness. The dynamics of a small fleet continue to challenge our sustainment efforts primarily due to vanishing vendors and diminishing sources of supply. Air Force Materiel Command is working to ensure timely parts availability; however, many manufacturers do not see a strong business case in supplying parts for a small aircraft fleet. Problems with a single part can have a significant readiness impact on a small fleet that lacks the flexibility of a large force to absorb parts shortages and logistics delays.

Long Range Strike Bomber (LRS–B)

The combat edge our B–2 provides will be challenged by next generation air defenses and the proliferation of these advanced systems. The LRS–B program will extend American air dominance against next generation capabilities and advanced air defense environments. We continue to work closely with partners throughout the Air Force to develop the LRS–B and field a fleet of new dual-capable bombers; scheduled to become operational in the mid-2020s. Make no mistake—the LRS–B will be a nuclear bomber. However, the platform will not be delayed for use in a conventional capacity while it undergoes final nuclear certification. We request your support for this essential program to ensure we maintain the ability to hold any target on the globe at risk.

Air Launched Cruise Missile

The AGM–86B Air Launched Cruise Missile (ALCM) is an air-to-ground, winged, subsonic nuclear missile delivered by the B–52. It was fielded in the 1980s and is well beyond its originally designed 10-year service life. To ensure the B–52 remains a credible part of the triad, the ALCM requires Service Life Extension Programs (SLEP). These SLEPs require ongoing support and attention to ensure the ALCM will remain viable through 2030. Despite its age, last year we successfully conducted six flight test evaluations, and we plan seven this year to fully comply with U.S. Strategic Command directives.

Long Range Stand-Off Missile

The LRSO is the replacement for the aging ALCM, which will have significant capability gaps beginning late this decade and worsening through the next. Replacement of the ALCM was identified by OSD in a 2007 Program Decision Memorandum and reiterated in the 2010 Nuclear Posture Review, the Airborne Strategic Deterrence Capability Based Assessment, and the Initial Capability Document. In a similar manner to LRS–B, the LRSO is necessary to ensure we maintain a credible deterrent in the future with the ability to strike at targets from beyond contested airspace in anti-access and area denial environments. The LRSO will be compatible with the B–52, B–2, and the LRS–B platforms. The LRSO AoA is complete and JROC approved, and in February of last year the Air Force Chief of Staff signed the Draft Capabilities Development Document. LRSO was selected by SAF/AQ as a pilot program for "Bending the Cost Curve" and "Owning the Technical Baseline," which are new acquisition initiatives and is currently planned for reaching Milestone A next fiscal year. We fully intend to develop a conventional version of the LRSO as a future spiral to the nuclear variant.

B61

The B61–12 Life Extension Program (LEP) will result in a smaller stockpile, reduced special nuclear material in the inventory, and improved B61 surety. AFGSC is the lead command for the B61–12 Tail Kit Assembly program, which is needed to meet STRATCOM requirements. The B61–12 Tail Kit Assembly program is in the Engineering and Manufacturing Development Phase 1 and is synchronized with NNSA efforts. The design and production processes are on schedule and within budget to meet the planned fiscal year 2020 First Production Unit date for the B61–12 Tail Kit Assembly, and support the lead time required for the March 2020 B61–12 all-up round. This joint AFGSC/NNSA endeavor allows for continued attainment of our strategic requirements and regional commitments.

SECURITY

Nuclear security is a key function of the Command's mission. A major AFGSC initiative to ensure security continues to be the new Weapon Storage Facilities (WSF) which will consolidate nuclear maintenance, inspection, and storage. We have put forward a $1.3 billion program ($521 million across the FYDP) to replace all deficient buildings across our aging 1960's-era Weapon Storage Areas with a single

modern and secure facility at each of our bases. This initiative eliminates security, design, and safety deficiencies and improves our maintenance processes. We have included $95 million in funding for the WSF at F.E. Warren AFB, WY, in this year's budget and the MILCON for the remaining facilities in future years. These facilities are needed to meet requirements for a safe, secure, and effective nuclear arsenal.

Through our continuing efforts to improve security and thanks to your strong support, we have completed the fast rising B–Plug system and the Remote Visual Assessment (RVA) system installation at all 450 LFs. These two programs better protect our nuclear weapons. The fast rising B–Plug enables our teams to secure the LFs quickly ensuring the weapons remain secure. RVA enables our security forces members to have increased situational awareness as they determine response actions at a given LF.

NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS

The ability to receive Presidential orders and convert those orders into action for the required weapon system is both critical to performing the nuclear mission and foundational to an effective strategic deterrent. As the Air Force Nuclear Command, Control, and Communications (NC3) Chief Architect, AFGSC plays a pivotal role in providing reliable and survivable NC3 systems to support national objectives. Cryptographic modernization upgrades allowed Air Force nuclear operations to transition to more secure equipment and satellite communications networks. These transitioned networks greatly improved security of sensitive nuclear command and control message traffic. Our weapon systems are only as good as the NC3 that underpins them and therefore we have redoubled our efforts in this area. We recently held the first-ever NC3 General Officer Steering Group to address top sustainment and readiness concerns. Additionally, AFGSC has been named the lead command for Air Force NC3 issues. Consolidating NC3 authority within the Service will enable us to better advocate for, support, and upgrade these critical systems. As the NC3 lead, AFGSC is participating in an Office of Secretary of Defense led 45-day study to analyze NC3 systems and future capabilities across the Services. In addition, the Chief of Staff of the Air Force directed AFGSC to stand up a task force to develop an organizational construct to ensure AFGSC is resourced and has the appropriate authorities and command relationships to execute responsibilities as it assumes the newly designated role as the Air Force lead for the NC3 mission area. Efforts like this study combined with ongoing and future upgrades to the NC3 systems will improve reliability and readiness of this critical capability across the DOD.

Global Aircrew Strategic Network Terminal

The Global Aircrew Strategic Network Terminal (ASNT) program will provide a fixed and transportable system of survivable NC3 Command Posts. These Command Posts support nuclear-tasked bomber, tanker, National Airborne Operations Center (NAOC), Take Charge and Move Out aircraft (TACAMO), reconnaissance forces, and nuclear reconstitution teams. Global ASNT is one part of the ground element of the larger Minimum Essential Emergency Communications Network. Global ASNT replaces degraded legacy NC3 systems in AFGSC, Air Combat Command, Air Mobility Command, U.S. Air Forces Europe, Air National Guard, and Air Force Reserve Command thereby providing redundant strategic communications paths. Global ASNT recently moved into the Engineering and Manufacturing Development phase of the acquisition process and full operational capability is expected in 2020.

NEW STRATEGIC ARMS REDUCTION TREATY

New Strategic Arms Reduction Treaty (START) implementation continues ahead of schedule. In the latest data exchange with the Russians, the U.S. Government reported only 912 deployed and non-deployed strategic delivery vehicles, down from the 1,124 reported at entry into force in early 2011, and well on the way to the required 800 combined deployed and non-deployed strategic delivery vehicles. We completed all of our planned silo eliminations which included 50 Peacekeeper LFs, 50 Minuteman III LFs, and 4 test LFs. With the last Peacekeeper LF elimination, Peacekeeper is no longer accountable under NST. We completed all de-MIRV (i.e., moving to a single reentry vehicle configuration) actions in May of last year. AFGSC plans to remove 50 MM III boosters from LFs across the missile fleet; the booster removals are scheduled to begin next month with 9 boosters scheduled in fiscal year 2015. Additionally, we will reduce the number of dual-capable B–52H aircraft by converting 42 of them to a conventional-only configuration. Importantly, our B–52 fleet will maintain all of its conventional capability. The first B–52 conventional only conversion is scheduled for August of this year with an exhibition for Russian

inspectors to immediately follow. All NST implementation actions are on time and within budget.

NUCLEAR DETERRENCE OPERATIONS CORE FUNCTION

We continue to improve and strengthen the nuclear enterprise through our long-range planning efforts. One of the methods we use to inform our Nuclear Deterrence Operations long-range planning and investment strategy efforts is wargaming. Strategic Vigilance, AFGSC's biennial wargame, will be held this year and will build on previous scenarios to strengthen command innovation and preparation. These wargames help us anticipate future conventional and nuclear planning to further improve our strategic deterrence and assurance mission areas. Ultimately, this allows AFGSC to better organize, train, and equip our forces. Additionally, we continue to observe other wargames and stay engaged with our partners in the other services to learn from their experiences.

2015 FOCUS AREAS (OUR PRIORITIES)

Deter and Assure with a Safe, Secure, and Effective Nuclear Force

Nuclear weapons demand a culture where safety, security, and effectiveness permeate all aspects of this critical national mission to include our people who embody this special trust and responsibility through all facets of their profession. As the greatest Air Force in the world we will only remain dominant through their professionalism, dedication, and commitment to service—and living our Air Force core values. Although we will continue to be challenged with sustaining aging weapon systems, we will leverage the innovation of our great airmen to get the most out of our resources.

Win the Fight

Whether that fight is in overseas contingencies where we have over 1,000 airmen deployed, or with our over 900 member nuclear deterrent force deployed to the missile fields conducting a combatant commander assigned mission every day, we will forge ahead to keep both our nuclear and conventional forces combat ready.

Strengthen and Empower the Team

We will continue to improve the quality of life for our airmen and their families, aware of the unique demands of our mission and our locations. We will continue to foster resiliency within a wingman culture, and we will improve education, training, and development at all levels. Furthermore, we will continue to strengthen, broaden, and deepen our culture around our command values of:

- Individual responsibility for mission success
- Critical self-assessment of our performance
- Uncompromising adherence to all directives
- Superior technical and weapon system expertise
- Persistent innovation at all levels
- Pride in our nuclear heritage and our mission
- Respect for the worth and dignity of every airman
- Safety in all things large . . . and small

Shape the Future

We will stay focused on our human capital development and our weapon system modernization initiatives. Our responsive and resilient MM III, providing the foundation for strategic stability, must be sustained to 2030 until we are able to fully implement the Ground Based Strategic Deterrent weapon system. The B–52 will remain the Nation's visible deterrent for the next 25 years at least, and will prove a versatile platform with unmatched battlefield persistence. The B–2 will be our strategic penetrating platform denying safe haven to any adversary. The dual-capable Long Range Strike Bomber will ensure we can continue to hold any target on the globe at risk. As our Air Launched Cruise Missile becomes obsolete and unsupportable, we will field a credible and flexible deterrent with the Long Range Stand-Off missile.

Uphold the Standard

We understand the importance of ensuring compliance at all levels through critical self-assessment of our performance. We have undergone a complete shift in our AF inspection system to continually assess and fix problems; we refuse to walk by any problem area. One of the ways we uphold our standards is through inspections. We continue to implement the new Air Force Inspection System and integrate our nuclear inspections with that system. The Commander's Inspection Program (CCIP) is monitored virtually by our command IG and validated by a Unit Effectiveness In-

spection (UEI) Capstone event every two years. Going forward, we will continue to utilize our rigorous inspection process to ensure the highest of standards and determine areas of the mission that require improvement.

CONCLUSION

Thank you for your continued support of Air Force Global Strike Command and our nuclear deterrent and global strike missions. The President's 2015 National Security Strategy is clear: "As long as nuclear weapons exist, the United States must invest the resources necessary to maintain—without testing—a safe, secure, and effective nuclear deterrent that preserves strategic stability." To that end, our enduring challenges in AFGSC are: first, to instill a culture where every airman understands the special trust and responsibility of nuclear weapons; second, to maintain excellence in our conventional forces; third, to sustain the current force while modernizing for the future; and fourth, to solidify and sustain a culture where our airmen are proud to serve in and embrace the great importance of the deterrent mission.

Fiscal constraints, while posing planning challenges, do not alter the National security landscape or the intent of competitors and adversaries, nor do they diminish the enduring value of long range, strategic forces to our Nation. Although we account for less than one percent of the DOD budget, AFGSC nuclear forces represent two-thirds of the Nation's nuclear triad and play a critical role in ensuring U.S. national security, while AFGSC conventional forces provide joint commanders rapid global combat airpower. AFGSC will continue to seek innovative, cost-saving measures to ensure our weapon systems are operating as efficiently as possible. Modernization of the nuclear enterprise, however, is mandatory. AFGSC is operating B–52s built in the 1960s with equipment designed in the 1950s; our ICBMs are operating with 1960s infrastructure; and utilizing 1960s era weapon storage areas. We cannot afford to delay modernization initiatives across the two legs of the Nation's nuclear triad.

It is my absolute privilege to lead this elite team empowered with special trust and responsibility, and I can assure you that we at Air Force Global Strike Command will meet our challenges head-on in order to provide our Nation with safe, secure, and effective forces for nuclear deterrence and global strike operations.

Senator SESSIONS. General Harencak?

STATEMENT OF MAJ. GEN. GARRETT HARENCAK, USAF, ASSISTANT CHIEF OF STAFF, STRATEGIC DETERRENCE AND NUCLEAR INTEGRATION

General HARENCAK. Chairman Sessions, Ranking Member Donnelly, thank you for the opportunity to appear before the subcommittee today to discuss Air Force nuclear policies and programs. I respectfully request my written statement be entered into the record and look forward to your questions.

[The prepared statement of General Harencak follows:]

PREPARED STATEMENT BY MAJ. GEN. GARRETT HARENCAK, USAF

INTRODUCTION

Chairman Sessions, Ranking Member Donnelly, and distinguished members of the subcommittee, thank you for the opportunity to discuss Air Force nuclear programs and policies.

As the Assistant Chief of Staff for Strategic Deterrence and Nuclear Integration, my team, on behalf of the Secretary and Chief of Staff of the Air Force, leads planning, policy development, advocacy, integration, and assessment for the airmen and weapon systems performing Nuclear Deterrence Operations, a core function of the U.S. Air Force. In today's increasingly complex, multi-polar environment, the highly stabilizing deterrence and assurance effects provided by Air Force nuclear forces—intercontinental ballistic missiles (ICBMs), nuclear-capable bombers, and dual capable aircraft (DCA)—will continue to play a critical role in ensuring the security of the United States and assuring our allies and partners.

Throughout the 1990s and early 2000s, a confluence of forces contributed to an erosion of the nuclear mission within the Air Force. This period of decline was characterized by a loss of senior leader focus, fragmentation of responsibility, and chron-

ic underinvestment in our personnel, weapon systems, and supporting infrastructure. While in recent years we have reversed this downward trend and made substantial progress towards addressing these deficiencies and the problems that resulted from them, we recognize considerable work lies ahead. As Secretary James has emphasized, restoring the health of the nuclear enterprise is an undertaking that will require sustained, long-term focus and effort.

Despite challenges, the dedicated airmen who accomplish the nuclear mission every day continue to do so with remarkable professionalism, pride, and determination. For these women and men and the Nation they serve, the Air Force remains fully committed to identifying and confronting systemic issues in our nuclear forces, and making the investments necessary to ensure they remain credible and effective in the decades ahead.

NUCLEAR ENTERPRISE REVIEWS

From the outset of the Internal and Independent Nuclear Enterprise Reviews (NERs) directed by former Secretary of Defense Hagel in February 2014, as well as the review led by the Commander, U.S. Strategic Command (STRATCOM), the Air Force partnered closely with the assessment teams to provide unfettered access to our operations, personnel, and processes.

Combined, these assessments examined an extensive range of personnel, management, oversight, mission performance, training, testing, and investment areas across the nuclear enterprise. To date, we have implemented a number of the Air Force-specific recommendations produced by the NERs, and our work towards completing the remaining ones continues at a steady pace.

Under the direction of our Secretary and Chief of Staff, and with oversight and guidance from the Nuclear Deterrent Enterprise Review Group (chaired by the Deputy Secretary of Defense) and the Senior Oversight Group (chaired by the Director of Cost Assessment and Program Evaluation), we are approaching the implementation and tracking of NER follow-on actions through a systematic and responsive process, one intended to yield tangible and lasting improvements.

Following completion of the NERs in the fall of 2014, the Air Force's immediate efforts were concentrated on addressing the most exigent gaps identified in the reviews. As we gradually transition our attention this year to implementing NER initiatives that require longer-term action, we are placing renewed emphasis on strengthening assessment processes and developing valid metrics to ensure that the changes we institute are measurable and enduring. While continuous improvement and rigorous self-assessment have been guiding precepts of our efforts to strengthen the enterprise since our broad reorganization of this mission area in 2008–2009, we recognize that the success of our NER follow-on actions is critically dependent on how well this effort is integrated into existing Air Force nuclear oversight structures and processes, where our senior leadership can apply sustained focus, provide accountability, and marshal necessary resources.

Consistent with that objective, NER findings have assumed a central place in the agendas of our Nuclear Oversight Board, chaired by the Secretary and Chief of Staff with participation from all ten of our major command commanders, and the three-star level Nuclear Issues Resolution and Integration board. Both of these bodies, which are organized and managed by AF/A10 and meet quarterly to focus exclusively on issues of importance to the nuclear mission, serve as vital cross-functional forums where senior leaders can decisively prioritize, resource, and direct the implementation of solutions across the Air Force. We have determined that the Flight Plan for the Air Force Nuclear Enterprise, a comprehensive roadmap that outlines a series of strategic vectors for improving and monitoring the health of the nuclear enterprise, is the best framework through which to orchestrate our long-term NER response. Aligned in four focus areas—human capital, governance, inspections and assessments, and resourcing, with an understanding that culture and morale are impacted by all of them—these vectors each have a corresponding action plan with execution and follow-up responsibilities assigned to specific Air Force entities.

The NER process has fostered an unprecedented renewal of senior level focus and collaborative engagement on the nuclear mission from the highest levels of the Department of Defense (DOD), and is already leading to positive outcomes that are visible throughout the force. We are optimistic that the new mechanisms created by the NERs can serve as a benchmark for future interagency collaboration as the Air Force continues its efforts in the coming years to improve the nuclear mission.

SUSTAINING THE EFFECTIVENESS AND CREDIBILITY OF OUR FORCES

As long as nuclear weapons exist, the consequences of their potential use against the U.S. remains an existential threat that demands our strategic forces be pre-

pared to meet not only the most likely contingencies, but also the most unlikely. President Obama has established a clear mandate that the United States will maintain safe, secure, and effective nuclear forces, even as we seek the peace and security of a world without nuclear weapons and take concrete steps to reduce our total number of weapons and the role they serve in national security strategy.

Consistent with the President's imperative, the fiscal year 2016 budget request seeks key investments in the sustainment, modernization, and recapitalization of Air Force nuclear weapon systems, supporting infrastructure, and our nuclear command, control, and communications capabilities (NC3). In addition, the budget provides strong support for our most critical asset: the Airmen we entrust to perform nuclear deterrence operations every day. Closely aligned with the priorities established by the NERs, as well as in multiple internal Air Force reviews of the nuclear enterprise, these investments in our air and ground legs of the Triad make important headway towards ensuring these systems remain effective and credible now and in the years ahead.

WEAPON SYSTEM INVESTMENT

The fiscal year 2016 budget supports an array of modernization initiatives for our B–2A and B–52H bombers that will enable these aircraft to remain capable of performing their assigned nuclear and conventional missions. Despite these upgrades, both the B–52H (delivered in 1961–1962) and the B–2A (delivered throughout the early/mid-1990s) are becoming increasingly vulnerable to modern air defenses. Accordingly, the fiscal year 2016 budget advances research and development efforts for the Long Range Strike-Bomber (LRS–B) in order to ensure the Nation retains a credible global strike and power projection capability in the decades ahead. We are anticipating a contract award for LRS–B in late spring of this year, with initial operational capability (IOC) for the planned fleet of 80–100 aircraft in the mid-2020s.

The budget funds life extension to 2030 of the AGM–86B air launched cruise missile (ALCM)—the Nation's only air-delivered stand-off strategic weapon, fielded by the Air Force in 1982 with a designed service life of 10 years. When employed from B–52H bombers, ALCMs provide an extremely valuable signaling capability and a degree of versatility unmatched elsewhere in the Triad. For these and other reasons, the fiscal year 2016 budget request restores funding to the critical Long Range Stand-Off (LRSO) effort, a follow-on ALCM program that will eventually replace the AGM–86B. The funding level requested enables the program to meet STRATCOM's operationally required need date and realigns Air Force integration efforts with the Department of Energy (DOE)/National Nuclear Security Agency (NNSA) life extension program (LEP) to produce an LRSO warhead.

The life extension effort for the B61, the Air Force's primary gravity nuclear weapon, is equally important to the continued effectiveness of our deterrence and assurance capabilities. Both the B61–12 LEP, which DOE/NNSA manages, and the associated Air Force Tailkit Assembly program are supported in the fiscal year 2016 DOE/NNSA and Air Force budgets. These efforts are synchronized and on schedule to deliver the first production unit B61–12 in 2020. The fiscal year 2016 Future Years Defense Program (FYDP) also supports risk reduction activities for dual capable aircraft (DCA) integration for the F–35 Joint Strike Fighter. Our goal of reaching IOC for F–35 DCA with the life-extended B61–12 by 2024 remains unchanged. This program remains an important and highly tangible signal of the U.S.'s continued commitment to the North Atlantic Treaty Organization, which has repeatedly affirmed the role of nuclear deterrence in the collective security of the Alliance.

Several sustainment programs for the Nation's fleet of Minuteman III (MM III) ICBMs and supporting infrastructure are funded in the fiscal year 2016 budget that will extend the effectiveness of this system through 2030, consistent with Congressional mandates. For more than 50 years, continuously on-alert ICBMs have been a foundational pillar of America's strategic deterrent, providing a level of responsiveness and stability not replicated by other legs of the Triad. In order to preserve this capability for the Nation beyond the phase out of MM III, the fiscal year 2016 budget supports continued development and risk reduction for the follow-on Ground-Based Strategic Deterrent (GBSD) program. Last summer, Air Force Global Strike Command (AFGSC) completed the GBSD analysis of alternatives, and the program is already leveraging synergies with MM III modernization efforts to meet a target IOC in 2027.

For our major weapon system modernization and recapitalization efforts, the Air Force's partnership with DOE/NNSA—responsible for life extension of the nuclear explosive packages at the heart of our gravity weapons, cruise missiles, and ICBM reentry vehicles—remains productive and strong. Our ongoing cooperation with the

Department of the Navy on ballistic missile sustainment, intended to leverage commonalities between the Air Force's MM III ICBM and the Navy's Trident II (D5) submarine-launched ballistic missile, is helping both Services reduce program risk and improve affordability. Through the joint DOD–DOE Nuclear Weapons Council and other interagency channels, we will continue to pursue new opportunities to strengthen integration with our mission partners to ensure the success of our programs.

ADDRESSING OTHER CRITICAL MISSION NEEDS

The fiscal year 2016 budget addresses a host of other important mission needs, particularly across the ICBM force. These investments include the establishment of a program office to manage recapitalization of the Vietnam-era fleet of UH–1N utility helicopters performing the ICBM security mission, as well as the replacement of aging ICBM payload transporters with updated models. Complementing the longer-term modernization and recapitalization programs underway for the missile force, this budget also advances multiple initiatives to address immediate, near-term ICBM operations and maintenance needs.

Prior to the formal initiation of the NERs, in January 2014 AFGSC acted decisively to uncover and address urgent shortfalls throughout the missile wings through its Force Improvement Program (FIP). Guided by actual feedback provided by Airmen in the field performing missile operations, FIP yielded a diverse set of actionable recommendations, many of which were implemented or initiated last year with fiscal year 2014 and fiscal year 2015 investments. Examples of improvements for the ICBM force supported by FIP to date include incentive pays, scholarships, fielding of important test and maintenance equipment, refurbishment and deep cleaning of launch control centers and alert facilities, new utility vehicles, and upgraded tactical equipment and uniforms for our security forces. Most significantly, FIP is supporting the addition of approximately 1,100 billets across AFGSC to strengthen manning in key nuclear specialties, as well as 158 technical and engineering billets at Air Force Materiel Command that will help preserve specialized skillsets within the nuclear sustainment enterprise and advance the GBSD program.

The fiscal year 2016 budget also makes important first steps towards reversing the trend of decline in our critical nuclear mission facilities, particularly our 1950s-1960s era Weapons Storage Areas (WSAs) that support nuclear munitions storage and maintenance. The fiscal year 2016 FYDP includes military construction funding to initiate the first phases of a comprehensive plan—the Weapons Storage Facility (WSF) Investment Strategy—that will replace existing WSAs with modern WSFs at AFGSC installations in the coming years. Additionally, the budget supports robust facilities sustainment, restoration, and modernization levels that will allow AFGSC to begin addressing a number of previously deferred infrastructure repairs across its ICBM and bomber installations.

As the lead military service for approximately two-thirds of the Nation's NC3 systems, the Air Force continues to work to improve focus on and resourcing of this vital mission. Critical to the execution of the nuclear mission, as well as Presidential and senior leader communications, NC3 must be secure, redundant, and highly survivable to ensure continuous connectivity in all environments. In order to consolidate and strengthen the life cycle management process for NC3, we continue to collaborate with mission partners to define key NC3 system elements, interdependencies, and authorities. In February of this year, the Secretary and Chief of Staff designated AFGSC as the Air force lead for this mission area. In this capacity, AFGSC is presently leading an Air Force Task Force charged with assessing oversight and organizational relationships related to NC3 acquisition and sustainment, as well as participating in a comprehensive DOD led NC3 capabilities study.

STRENGTHENING POLICIES TO SUPPORT THE MISSION

We are effectively capitalizing on the NER process to address longstanding inefficiencies in many administrative and policy areas affecting the nuclear enterprise. In close partnership with AFGSC and other Air Force, Joint, and DOD stakeholders, over the past 12 months we have implemented a number of important revisions to key programs and policies that are yielding substantial efficiencies. For example, we have restructured our Personnel Reliability Program (PRP) to eliminate redundancy and vastly reduce the number of individuals required to be covered by the program. We anticipate these changes will result in considerable reductions in the man-hours required to administer PRP, while at the same maintaining the integrity and intent of the program.

Through the NERs we have accelerated previously initiated efforts to refine the scope and methodology of our nuclear inspection process, with the goal of reducing duplicative structures, providing wings with critical "white space" to focus on successful performance of the mission in lieu of constant preparation for inspections, and empowering Airmen to innovate by removing unnecessary requirements that promote micro-management and perfectionism. We continue to strengthen the ICBM career field by creating new paths for professional development and education, providing additional opportunities for leadership experience, and offering incentives to our missileers who elect to pursue higher levels of responsibility.

TREATY COMPLIANCE EFFORTS

In accordance with the terms of the New Strategic Arms Reduction Treaty, Air Force activities to align our ICBM and heavy bomber forces with the treaty-compliant force structure established by DOD last spring by the deadline of February 2018 remain on track. In support of this effort, modifications to treaty-accountable ICBM silos and bombers will continue in 2015. Consistent with statutory mandates and STRATCOM requirements, we continue to preserve the capability to reconfigure MM III ICBM with multiple warheads.

CONCLUSION

The realization of the benefits intended from these investments and the Air Force's ability to continue supporting combatant command nuclear requirements is critically dependent on the funding levels requested in the President's budget. As the Secretary and Chief of Staff have made clear, should the Air Force have to operate at sequestration-level funding in fiscal year 2016, no mission area—including nuclear deterrence operations—would be impervious to its effects.

Thank you for the opportunity to update the subcommittee on Air Force nuclear enterprise policies and programs and our actions to implement NER recommendations. Our near- and long-term commitment to continuous improvement of the nuclear mission—particularly through the deliberate development of our airmen—will remain one of the Air Force's top priorities.

STATEMENT OF SENATOR JEFF SESSIONS, CHAIRMAN

Senator SESSIONS. We are sorry to have this program interrupted, but I think it is time for us to go ahead and move forward, as Senator King and Donnelly reminded me.

So we got a lot going on, and I would just say in terms of an opening statement, I do believe the Department of Defense, Ms. Creedon, and others has responded to this problem. I think Secretary Hagel deserves credit for insisting that we make an honest and very serious review, which you have done and I thank you for. Some of the findings are extremely troubling I thought, some of which is classified, but I believe that you folks are on that.

Secretary Hagel said that the reviews found evidence of systemic problems that if not addressed could undermine the safety, security, and effectiveness of the elements of the force in the future. Close quote. I think that is a serious comment, and we need to address it.

Admiral Benedict, I know your naval submarine crews and others are on constant stress and alert and acting. Ships are moving things. Plans are being executed. It perhaps is more difficult, I think, for the Air Force where you are at bases and missiles are in silos and not as much is happening. So I can understand the difficulties that we might have in maintaining the kind of alertness and morale that you need to have.

Previous briefings I have had so far on this subject indicate that the Air Force is taking aggressive action to create the kind of morale and attention and evaluation that is necessary. But we will have, I am sure, other questions that would be asked.

Also, from what I can see from Secretary Hagel's announcement, we may be talking about a 10 percent increase. That could be as much as $8 billion, and you can buy a lot with $8 billion. So I think we need to ask the question can we achieve the kind of improvements we need with less cost than that.

On this vote, Senator King, you have not voted. Is that right? Did it just get called?

Senator KING. This is the next one.

Senator SESSIONS. Well, there should not be much time left, is that not right, for us to vote? 5 minutes, okay. We are in better shape than I thought.

Ms. Creedon, the review found that, quote, significant changes are required to ensure the safety and security and effectiveness of the force in the future. Can you give us some examples of where safety and security and effectiveness are at risk and some examples of recommendations that you might make? And what is meant by cultural and structural changes?

Ms. CREEDON. Thank you, sir. So let me start probably on the end of that.

On the cultural changes—and I will just use a couple of examples to illustrate some of these. On the cultural side, we found that particularly in the Air Force, there was not a good culture of strong self-assessments that could provide up the chain of command no-kidding assessments of what was going on in the forces. So we found that what was happening was problems were not raised to the next level of attention, and when problems were raised, they were not treated with any significant degree of credibility. So what we had was a situation where the senior leaders for the most part did not even know how bad some of the situations were at the working level because they were simply not putting in place any sort of a good self-assessment regime or having any good, candid opportunities for conversation within the services.

On the organizational, again an illustrative example. We found that particularly that the way the Air Force was organized for maintenance of the ICBMs, that the Air Force did not treat the entire universe of the ICBM as a single weapon system. So you have the missile itself. You have the silo that it is in, and the silos are covered by launch control centers. And the launch control centers then talk within their missile field. That whole missile field was not considered as a weapon system. So as a result, you had different pieces of the Air Force and different sources of money responsible for the long-term maintenance of different parts and pieces. So there was no holistic way to look at that ICBM system as a system of systems. So you had some parts of the Air Force taking care of other things, and then you had the base commanders taking care of other things. And particularly when the base commanders were using their money, we found that the base commanders were forced with choices of, say, plowing the snow or fixing blast doors on a large control facility. So they were not organized structurally to fix this.

On the safety and security, for the most part, what we were worried about was the safety and security of the forces as they were operating. So we found in many instances that their equipment just was not adequate. So at the missile fields, for instance, these

missile fields are all in the north. They have terrible winters. They have lots of snow, lots of ice, and yet the security forces were driving around in SUVs that were front-wheel drive. So it was as minor as that that could fix some of these no-kidding safety of life sorts of things.

Senator SESSIONS. And can you give an example of a specific action such as the confused support system you just described that have been done to improve that? Maybe, General Wilson, you could comment on that. What steps do you think that you have taken that would alleviate some of the problems that Ms. Creedon just described?

General WILSON. Thank you, Chairman Sessions. Let me give you three examples.

The first thing that she talked about is cultural. So the big culture change that we have embarked upon is one of empowerment, empowering our airmen. So we started a force improvement program, and the force improvement was a different look. So it is a bottom-up look and it was a multi-diverse team of people who made up this individual—so in operations, it would be operators from each of the ICBM wings with submarine operators with airplane operators to give a different perspective.

As part of the force improvement program, the ICBM alone has brought forward over 350 recommendations from the airmen doing the job on how to do it differently and better.

Senator SESSIONS. These recommendations were from the ground up.

General WILSON. From the ground up, so from the people doing the job. And I look at it as our job to remove the barriers to their success. So as an example, as Secretary Creedon just mentioned, the defenders out in the field did not have the right uniforms and the right vehicles and the right equipment. That has all been changed. Based on their recommendations, we went out and said what is the best cold weather gear and the best gear that we can get for the environment that they are in. We have funded that. We have delivered it to the field. It was no small task to do it. Just for the defenders in the security force, it was over 250,000 individual line items that were delivered to the field.

But in addition to the uniforms, we provided new vehicles, new radios, and we greatly improved the training of the security forces that they get. We do that at Camp Guernsey in Wyoming.

So we are building a model defender program and the model defender is not just the outer gear. It is the whole human weapon system with the goal of making our airmen—the place that everybody wants to go to for the mission because they are doing a vitally important mission for our Nation, and we are equipping them properly with the right tools to do the mission.

Senator SESSIONS. Thank you, General Wilson.

Of course, this is a big deal. Errors cannot happen in the area that you operate in. My impression, General Wilson, is the Air Force has taken seriously the concerns and have responded in a serious way. Without getting into too many details, would you explain to us the role Secretary of Defense Hagel had in moving this forward and what you can tell us—my time is already over. No. I guess I did my opening statement in this.

But can you tell us what you have done that would convey to the Congress and to the American people that you have seriously evaluated the concerns in the report and from top down, actions are being undertaken to fix it?

General WILSON. Yes, sir. If I were to describe it, first of all, the change from the past. So what is different today is we certainly have the attention and the focus of the senior leadership, both of the Department, the Secretary of the Air Force, and Chief of Staff of the Air Force.

Senator SESSIONS. They have been personally engaged.

General WILSON. They have been personally engaged in this.

As an example, the Secretary of the Air Force has visited each of our missile wings three times in the last year. She meets with our airmen. She gets their direct feedback. The Chief of Staff has done the same. They have been personally engaged. They both have talked about how do we put our money where our mouth is. We have said this is the most important mission. We need to put the resources behind it to do that. We are on track to be able to provide those resources now.

We do not disagree with anything in the reviews. Both the internal and the external reviews we are in complete agreement with. What we found is that our bottom-up reviews and the top-down reviews overlapped about 95 percent. Within that, we have got a multitude of areas that we are addressing, everything from ICBM training, recruiting, how do we evaluate, how do we instruct them from the security forces, how do we provide the right supplies and the maintenance. As Secretary Creedon talked about, how do we define the ICBM weapon system that had not been done before? There has been a multitude of efforts, but it is not just the ICBM. We started with the ICBM.

The next place we went is to our bombers, and we did a bomber force improvement program. And the bombers brought over 215 recommendations forward on how to do things better and more efficiently.

So we are looking at this as a continuous improvement cycle, but it is not something that is one time and done. We will go back out to the field. We have been going out to the field regularly listening to our airmen and saying are the things that we are doing helping. If not, how do we readjust, and what do we need to be doing differently? So we are taking this as a holistic, systemic view of the enterprise with persistent attention and focus, and now it is our job to make sure that we follow through with all the things that we have got underway.

Senator DONNELLY. General Harencak, have you given your opening statement yet?

General HARENCAK. Yes, sir, I have.

Senator DONNELLY. Very good.

Let me ask you this question, General Wilson, and that would be like a ?why,? which is somewhat speculative but in the reports as well. Why did these things happen? Is it that the type of mission that we have, being in a missile silo keeping an eye on things there, that it is not a desirable mission? It is not challenging enough, that members of the Air Force look at it as it was kind of a sidetrack to their career? How does this happen?

General WILSON. That may be part of it. It may be that we lost focus on the importance of what strategic deterrence does for our Nation. We got engaged in places around the world that took our eye off this. And we either relayed in some form or fashion that what the airmen were doing was not as important as other things.

I think we are seeing a change in that today. I will give you an example. We recently met a captain at Mahlstrom Air Force Base. He is an academy grad. He has a 3.8 Grade Point Average (GPA) in physics. He is finishing up his 4 years in the ICBM community. He said I have noticed a change in the last year. I have seen the differences in the empowerment and what it can make, and I want to stay in this weapon system. This is a once in a lifetime opportunity to be part of something bigger and to make a difference. And so he is staying in the ICBM community. That is not one person. You will see broadly across the community now with this increased focus and attention and people know the mission is important, that the airmen value that. We just did not do a very good job.

Senator DONNELLY. My perception is that it will be viewed as important as the leadership of the Air Force makes it to be in the public messaging you have and in the way you look at promotions there and ways of a career path there.

General WILSON. Yes, sir. Well, a couple of specific examples the Air Force has done—and you are well aware. We have elevated this position for this command from a three-star to a four-star. We have elevated the position of the A–10 on the headquarters air staff from a two-star to a three-star. Again, at all levels, we are seeing it. Before we would see not a lot of—from the different accession sources who would volunteer to go to missiles, they were seeing a complete difference. This year alone 29 first choice and all 174 coming in, it was in the top 6 choices. So it is making a difference.

Senator DONNELLY. Admiral Benedict, as you know, Indiana is home to the Naval Surface Warfare Center Crane. It provides a lot of support to Strategic Systems Programs (SSP). As you look at that, one of the things that we have worked on at Crane that a lot of folks have put time and effort into is trying to enhance collaboration or commonality among the Navy and the Air Force nuclear programs. And Crane has been involved in that work to ensure lessons learned and best practices are shared between the Services. And I was wondering your view of how we are doing at promoting collaboration and commonality on these programs and how can we do better.

Admiral BENEDICT. Yes, sir. Thank you.

We are working, I think, better today in a more collaborative manner on the topic of commonality than I think we have ever been between the U.S. Navy and the U.S. Air Force. I had the opportunity to host Air Force flags. In fact, Major General Harencak visited me when we were out there as part of the strategic forum seminar that Crane hosted so generously for us. We showed them all of our capability at Crane, and of course, Crane is the single largest warfare center provider for strategic systems in the United States Navy, and they do an exceptional job and they have for many, many years.

I think we continue to progress in this area. We have an official structure set up now where we are looking at various areas, one

of them in particular being rad hard electronics, of which Crane is intimately familiar with the way the Navy does business. We have identified that to the Air Force for their consideration as they move forward.

Another example of collaboration and commonality is on Monday of next week, I am flying to Omaha. I will join Admiral Haney in Omaha. I am flying up with Admiral Haney to be a part of the ICBM flag officers forum up at Cheyenne, WY, with all the ICBM flags. And I have the opportunity to pitch commonality in that forum to the Air Force generals.

So I think we are making good progress in that area, sir.

Senator DONNELLY. Thank you.

Ms. Creedon, I know that the internal report on the DOD nuclear mission was classified. But in this unclassified forum that we have here, what was your biggest surprise when you looked in determining how serious the issues were?

Ms. CREEDON. There were probably two. One was that although we knew going in that the Air Force had significant problems because there were many years of reports that had laid out a lot of these problems, the problems that we found were worse and they were much more systemic.

With the Navy, again the surprise was that although the strategic systems programs were good and the naval reactors programs were good, what we found was the part in the middle that neither Admiral Benedict nor Admiral Richardson had really much authority over—those were in worse shape than we had expected. And what I mean by those, those are a lot of the support facilities, particularly some of the shipyards. They were pretty severely understaffed. There was a pretty big bathtub in the mid-career sections, and the facilities needed a lot of work.

And as a result of that, we understood why the submariners were under as much stress as they were in their operational capacities. So, for instance, a lot of the work that in the past should have or would have been done by the shipyard once a submarine was in port was being done by the crew. So there were a lot of people and infrastructure things that we were surprised to find in the Navy.

Senator DONNELLY. Like how did we miss this or how did we get in this spot in your opinion?

Ms. CREEDON. That is probably one of those questions that needs an hour or so to fully unpack.

Senator DONNELLY. Actually I am on overtime right now, but nobody else is here. So this is awesome.

[Laughter.]

Ms. CREEDON. I will not take an hour.

But I would say it is a combination of things. I think General Wilson touched on a few of them. I think over time certainly at the Air Force, the mission had been sort of pushed to the side. I do not think the leadership across the board took much of the mission as seriously as possible, although I want to caveat very quickly on this, that the morale in the Navy was good where the morale in the Air Force was not good. So for some complicated reasons, the Navy had managed to keep the morale good.

There was just so much focus and attention over the course of the various wars in Iraq and Afghanistan that that is where you

wanted to be. So from the Air Force perspective, a lot of the folks found themselves—and these were their words. There are sort of two things that have stuck with me. They felt trapped. And there was another phrase that we ran into a lot, that they would say, well, I have the nuclear stink on me, so I do not have much of a future in the rest of the Air Force. So they did not see themselves as having much of a career progression.

All of this happened gradually. It happened over time. None of it was very quick. And so it will take a lot of time to rectify all these things. But it was very complicated, I think, how all these things happened, but a lot of it was I just do not think there was a lot of attention being paid at very senior levels to certain aspects of this enterprise.

Senator DONNELLY. General Wilson—and this goes back to what we were talking about before. You are seeing and changing and making sure that there is no stigma to being part of the nuclear program, I would assume.

General WILSON. Yes, sir. The goal is we want this to be something that people aspire to. And I am heartened today with some of our airmen, you know, what I see and the ability—we tell them you are going to be able to create your own future here. You own this. You can make a difference. Every airman's voice needs to be heard on how do we make this better. And then we are trying to empower them, and we are trying to clear the obstacles to their success at all levels. And once they start seeing the fruits of the success, they start believing it. And right now, I think they are just starting to see we have said and you are doing this. We have said this, you are doing this. They believe it. We are on a journey here but I think we are making some important progress.

Senator DONNELLY. I think that Senator Sessions should be back in just a minute or 2. I am going to run over and vote very quickly, and then I will come back. And if he is not back by then, you will be tortured by me again as I return.

Thank you very much. We will put this in the hearing. We will hold off until we get back from votes. Thank you very much.

[Recess.]

Senator HEINRICH [presiding]. Let me start out by thanking all of you for your patience with our voting schedule this afternoon. It has not been very conducive to these hearings. But I sure appreciate the work that all of you do.

I want to start out, General Harencak. It is great to see you. It has been too long. As you know as well as anyone, New Mexico is home to the Nuclear Weapons Center and the thousands of airmen who work very hard every day to ensure the safety and the reliability of our nuclear enterprise.

The 2014 nuclear enterprise review noted that there was, quote, a lack of promotion opportunities generally in the nuclear career field and a lack of a defined, sustainable career path for nuclear officers in the Air Force and career constraints resulting from nuclear specialization for both officers and enlisted personnel. Unquote.

What steps are you taking to fix these personnel issues to ensure that our airmen have increased opportunities and incentives to

enter and stay in this incredibly important field? General Wilson, do you want to take that?

General WILSON. Yes, Senator, absolutely. We have started for an ICBM operator a completely different model than we have done before. We are calling it the 3 Plus 3 model. So we give them 3 years where they experience in a missile field becoming a flight commander—excuse me—a deputy and then an aircraft commander, missile crew commander. At the 3-year point, we are going to PCS the majority of them to another base where they are going to become an instructor or a flight commander. And so we are going to develop a bench of expertise that they did not have before. So they are going to stay longer in their career field.

We also have a bunch of educational opportunities as we move forward, education with all the National labs. We are spending a lot of time working on what I call the human weapon system. What are the things we can do to improve the deterrence thinking of the 21st century? Locally we are starting a leadership development center where we will have touch points for our officers, our enlisted, and our civilians throughout their career where we provide them leadership development opportunities.

In addition to that, we are working with our Air Force partners at Air University to build a structure throughout the Air Force where we increase our deterrence thinking more broadly throughout the Air Force so that all airmen understand the importance of nuclear deterrence.

At the strategic level in the air staff, we are doing the same thing. So how do we get the Air Force into the National policy debates? So General Harencak and his team, working with others at headquarters Air Force and STRATCOM, our Navy partners to get into the debate at the National level.

And lastly we are working with academia throughout the world. We stood up something we call the Center for Assurance Deterrence, Escalation and Nonproliferation Science and Education (CADENCE). And what that is doing is bringing in academia from around the world to help improve how we do business, and they are doing some phenomenal research but how do we take advantage of that at the Air Force and more properly help our airmen.

So I think we have laid out a broader, deeper structure for airmen. They can see a path. And we tell people with the number of airmen today coming into the career field, we have more that want to stay in than we have room for. As they grow up, we are going to provide them leadership development opportunities, and we have a number of operational squadrons and ops officer positions and group commander positions. There is a future that you have to be an ICBM operator in the United States Air Force.

Senator HEINRICH. Fantastic.

General WILSON. We got a bunch of efforts underway to improve that.

And I will yield the remaining time to General Harencak here.

General HARENCAK. The only thing I would add, Senator, is the proof of this is truly in the pudding, and I am absolutely confident that the leadership of the United States Air Force is committed in the long term to the purposeful development of nuclear officers and enlisted airmen that all work in this field. So I believe that we

made structural and institutional changes to address your concern, and already we are seeing the benefits of that in just the last few months or a year.

Senator HEINRICH. And CADENCE. Where is that being stood up?

General WILSON. Shreveport, LA.

Senator HEINRICH. Fantastic.

And a related issue. As we know, nuclear missions require perfection. However, the nuclear enterprise review found that there is, quote, a blurring of lines between accountability and perfection in the Air Force. I was hoping you could explain what that means a little further. Either of you. General Wilson?

General WILSON. What I am telling our airmen today is that they own the future. We are not going to walk by any problems. So when you see a problem, you need to identify it, so this culture of self-assessment and being able to have someone hear your voice and say this needs to be fixed, we can do this better.

I recently had a conversation with a senior officer, and he said—

Senator HEINRICH. Basically you are saying accountability and perfection were working against each other in some cases.

General WILSON. We did. We had a culture that was about passing the next inspection, and the culture of inspections became the mission. Today we are telling our airmen that is not it at all. We need to understand the importance of our mission, but you are empowered to make a difference.

A senior officer said to me, well, you do not really believe a young airman has the wherewithal to—they just need to be told what to do. And I said, no, you are completely missing the boat. An example is a young airman at Barksdale Air Force Base who is 20 years old who works in the medical group, and he is a high school programmer. He was doing a job at that entry and realized I can do this better. He made a difference. He wrote a program that is now being used DOD-wide, and he is 20 years old. That is the type of empowerment we are talking about, and it is going on throughout our enterprise where the youngest airmen and our NCOs and our young officers are speaking up because they see a way to make it better, and we need to listen to them and then let them do their job.

Senator HEINRICH. Thank you.

Senator SESSIONS [presiding]. Senator King?

Senator KING. Thank you.

Ms. Creedon, I go to a lot of hearings around here, and

I am starting to think that instead of the U.S. Congress, we should call ourselves "Deficits are Us" because I keep encountering deficits and this is another one. Can you give me, very briefly, just in a few seconds, top line, what is the size of the nuclear enterprise deficit and what is the timeframe that we have to address it? Is it $100 billion, $50 billion, $20 billion? What is the number, and how much time do we have to do this before national security is truly jeopardized?

Ms. CREEDON. So I think first we need to understand exactly what our review did. So our review looked at the people in DOD, the systems in DOD that we have now and that we need to maintain until such time as we have replacement systems.

Senator KING. I understand that. I want a number.

Ms. CREEDON. So our estimate was a range of between $9 billion and $25 billion. I do not know the time because how those things get executed are up in the air. So we had said possibly as many as 5 years, somewhere along those lines.

Senator KING. That is the total number, though. $9 billion to $25 billion is the total number.

Ms. CREEDON. That is what we came up with. Not terribly scientific, but that is what we came up with, $9 billion to $25 billion. And it will take years to fix.

Senator KING. Thank you.

Second, I am concerned about command and control in this system and particularly in the world of cyber crimes. How are we doing on that front?

Ms. CREEDON. We are doing better. Obviously, a good bit of this needs to be taken to a classified session on this particular topic, but when we did our review, because of some work that had been done previously, one of the main areas of attention that we found that it had increased attention was the nuclear command and control. So although there is work to be done, it at least had, I think, started to get better.

Senator KING. It is being attended to.

Ms. CREEDON. It is being attended to.

Senator KING. General Wilson, the B–52 is reaching the end of its life, and we are talking about the long-range strike bomber, but that is still on the drawing boards. Is there a capacity gap? Will the B–52 last until the long-range strike fighter, bearing in mind that the last—the Defense Department average for new aircraft procurement is 23 years? That is the number that we saw in the full committee. Can we get from here to there with the B–52?

General WILSON. We can. We are planning to fly the B–52 for another 25 years. It has service life to go beyond that.

Senator KING. So you are confident in that platform for that period of time.

General WILSON. I am. We need to do some upgrades to it. But I am also confident that we need a new penetrating bomber. The B–52s that we have on our ramp are 1960 and 1961 models. The B–2, our new bomber, is 25 years old. So we absolutely need a new bomber. As technology improves around the world, the ability to hold targets at risk wherever they are on the planet is vitally important to our Nation and certainly to the United States Air Force.

Senator KING. I would like to follow up with you or whoever is appropriate about the long-range strike bomber, what the spec is, how it relates to the B–2 and the B–52. So that is a discussion we can have.

General WILSON. We would be happy to have that with you.

The information referred to follows:

Senator King was briefed on the Long Range Strike Bomber, what the spec is, and how it relates to the B–2 and the B–52 on May 7, 2015 by RCO, SAPCO and SAF/AQP.

Senator KING. If you could be in touch with my office because I want to understand before we undertake a new—before we get too far into a new vehicle, I want to have that opportunity.

Another deficit is Research and Development (R&D). Are there sufficient funds in the President's budget, if it were enacted as it is today, to do the R&D that is necessary to keep pace in a field which is essentially driven by technology? General Wilson, do you want to tackle that? Or, Admiral, why do you not give me a thought on that?

Admiral BENEDICT. Yes, sir. Well, I will address that as it relates to the *Ohio* replacement program, our new submarine. The answer is yes. As requested in the President's budget, if that is fully funded, then we will remain on track to do the design development and leading into production of that vitally important platform.

Senator KING. How about R&D generally in the nuclear enterprise?

Admiral BENEDICT. I would say from my position as Director of SSP, there are four areas that I think my counterparts here in the Air Force would agree if we are not investing in, no one is investing in, and those would be reentry body science, rad hard electronics to the levels that we have to, strategic propulsion, which is vital to both us and the ICBM force, as well as the guidance systems which are well beyond any commercial case.

Senator KING. Could a current ICBM be used to put a satellite in orbit, the same rocket?

Admiral BENEDICT. I will defer to the Air Force on that, sir.

General WILSON. I would think the answer would be yes. I would have to get with the pros to be able to do that. But an ICBM is going to fly a significant distance, halfway around the world and go up into the hundreds of miles high. So the answer would be yes.

Senator KING. Well, I am just interested because we are talking about satellite overhead architecture and vehicles, and I just want to be sure we are not having a different vehicle for every trip to the store. And I would like to follow up on that as well in terms of the appropriateness of multiple use of some of these vehicles that are being developed.

A final question. How is Russia doing in their compliance with New Strategic Arms Reduction Treaty (START)? Anybody? Answer quick. Nobody answering makes me nervous.

Ms. CREEDON. They are fine. Right now, the New START—they are full in compliance and we are full in compliance.

Senator KING. They are fully complying?

Ms. CREEDON. They are. It is one of the few bright spots in the relationship.

Senator KING. Good.

That is all I have, Mr. Chairman. Thank you.

Senator SESSIONS. A good question.

Admiral Benedict, with regard to the study and the Navy's response, are there things that impacted the Navy that you have undertaken to make our arsenal more safe?

Admiral BENEDICT. Mr. Chairman, both studies identified primarily two deficiencies within the U.S. Navy's actions. We are already in process. And we appreciate the confirmation that the two reviews gave us. Those are the infrastructure and, as Ms. Creedon stated, primarily in the shipyards. We were down in our shipyard worker numbers as a result of the impacts of sequestration. So those numbers were immediately authorized by Secretary Work

when he identified that. And so we are hiring somewhere around 2,200 personnel for the shipyards and our repair facilities. We are on track on that hiring process, and that will certainly increase the throughput in our shipyards.

The second piece, again as Ms. Creedon identified, was the infrastructure. We are now on a 15-year recapitalization plan of the naval shipyards, as well as a 25-year recapitalization program within the strategic weapons facilities that I am accountable for. So, yes, sir, we are on track.

Senator SESSIONS. Well, your answer to Senator King I guess, Ms. Creedon, was $9 billion to $25 billion. Now, this is in addition to what our current expected expenditures are?

Ms. CREEDON. Yes, sir. And it was to maintain the current systems in DOD between now and whenever they are replaced by the follow-on systems.

Senator SESSIONS. But you are not counting like the *Ohio*-class replacement or the new bomber?

Ms. CREEDON. That is correct.

Senator SESSIONS. That is not being counted. What does this money go for? I mean, we have been operating here for a long time, and we obviously are not at the level of safety and reliability we need to be. That is a huge sum of money.

Ms. CREEDON. And it is over a period of time. And I would turn to my colleagues for their indications as to how much each of them has begun to spend over the Future Years Defense Program (FYDP), but it is a wide range of things. Some of it is facilities. There are a lot of facilities that need to be replaced. Some of it is new equipment. The Air Force needs new helicopters for their missile fields. It is people. It is parts. It is a whole range of things. It is a very large bill, but a lot of it is facilities.

Senator SESSIONS. Well, $25 billion would buy a lot, a lot of helicopters, a lot of automobiles with heaters in them. I am just telling you.

I would think we need a specific request. So how would this reflect itself in future budget requests? You would just ask for more or are you talking about taking money out of existing programs?

Ms. CREEDON. Well, at that point, sir, I think I would like to turn it over to my DOD colleagues who are implementing the recommendations.

Senator SESSIONS. Gentlemen, do you have thoughts about that? I mean, this is not a blank check. I mean, we have got to honor the taxpayers? money, and we are worried about not being able to maintain sufficient force levels and other matters too in this Defense Department.

Admiral BENEDICT. Sir, if I may, I will go first.

Our fiscal year 2016 increase was $446 million. That is in our budget within the Navy, and our FYDP increase across the 5-year defense plan for the Navy totaled just slightly over $2 billion.

As Ms. Creedon said, the majority of that is personnel in the shipyards, as I explained. We have self-funded—

Senator SESSIONS. How many do you have in a shipyard now?

Admiral BENEDICT. Across all four shipyards, sir? I would have to get you the specific number.

Senator SESSIONS. 2,000 sounds like a big number.

Admiral BENEDICT. Yes, sir. Remember, these are the four naval nuclear shipyards. And so I do not have the exact number of all four in total. The number that I gave you, slightly over 2,200, is the increase to the existing workforce in order to ensure that we can maintain the throughput through that system. I do not have the total number, sir.

Senator SESSIONS. General Wilson?

General WILSON. Mr. Chairman, we added $5.6 billion over the FYDP for the nuclear enterprise. That covers a spectrum of things from both people. It covers milcon.

Senator SESSIONS. Well, is it not the rule of thumb that you can do—$1 billion is equal to 10,000 uniformed personnel?

General WILSON. I do not know the rule of thumb, Mr. Chairman. We added 1,100 people to the nuclear enterprise this last year to help us in every area from security forces to our operators to supply specialists. 1,100 was the plus-up that we got to the nuclear enterprise. Some of that is for procurement going forward. We included the long-range standoff weapon across this 5-year defense budget. We have about $700 million of milcon to start getting after the weapons storage areas across all of our bases. So we added $5.6 billion on this FYDP to the nuclear enterprise.

Senator SESSIONS. Well, I think we should see that in more detail. I think we should know more in detail about that and exactly how many people and just to say $5 billion and we are talking about $1 billion will produce about 10,000. So that is a lot of people.

Anyway, I think we have to look at this hard. We have got to create safety and reliability. We know you have been undercut and have not had sufficient funding for that, and we are going to have to find some more money. But doing it as smartly as possible would be good.

Senator Donnelly, I believe you are next. Has a vote started again or do you know?

Senator DONNELLY. Where we are at is there are a number of voice votes taking place right now, so about 10 to 15 minutes before the final recorded vote. I already went through questions, and so, Senator King or Senator Heinrich.

Senator SESSIONS. Please.

Senator HEINRICH. One more round if we have got the time.

And I would just make the point that, unfortunately, nuclear weapons have never sort of conformed to the sort of ratios between personnel, obviously, and hardware that we see in other parts of the DOD budget.

But I want to get back to a couple of issues with General Harencak and also Admiral Benedict. And you guys can decide who to answer first.

But the NNSA labs and plants through the current refurbishment programs for the B61–12, the W88 Alt 370, and the fuse for the W87 are leveraging rate, our technology across these life extension programs now. And I wanted to ask you is this sort of leverage beneficial to your programs. Is it cost-effective? And is there a benefit for the U.S. deterrent as the full-scale engineering and design of these programs starts to level off over the next few years for Air Force, Navy, and NNSA to think about some sort of joint engineer-

ing programs to maintain the institutional knowledge of the labs? workforce?

General HARENCAK. I will start, Senator. First off, as you are well aware, the tremendous work that the labs in New Mexico and Lawrence Livermore labs are doing in this collaboration. The short answer to your question is a resounding yes. We are leveraging. We are making affordable smart decisions where we collaborate with the United States Navy. And the B61 is a perfect example. There are components—we are just using Navy components in them, which has been obviously tremendously helpful. We are also collaborating on future ways that we could use joint common and adaptable materials, not just in hardware but also in our processes and using our people. We talked a little bit earlier about Navy Crane. The Navy is also using a facility in Heath, Ohio that the United States Air Force runs through a contractor, and it has also been enormously helpful.

I will say, though, I have been banging around this particular aspect—business for the last 6 continuous years, and I can tell you I have never seen better cooperation. Our B61 program at the NNSA is working with us, and with collaboration from the Navy is on time, on cost. And that is just one example of where this collaboration and the great work between the Department of Energy, the NNSA, the Navy, and the Air Force has occurred.

Senator HEINRICH. That is exactly what I was hoping to hear because I think as you heard from Senator Sessions, the chairman, while we all recognize that this enterprise is not cheap, we have to get the most bang for the buck possible in this environment.

I want to move on real quick to Kirtland Underground Munitions Storage Complex (KUMSC). General Wilson, as I understand it, the Global Strike Command now owns the Kirtland underground munitions and maintenance storage complex. This is a unique and strategic national asset. Do you have a long-term plan for its upkeep? And if you do, can you share it with the committee?

General WILSON. Senator, I completely agree that KUMSC is a national treasure. We have not taken control of Kirtland KUMSC yet. We will on 1 October. As we have talked in the past, though, in the Air Force corporate structure, as we modernize our weapons storage facility, KUMSC absolutely has to be part of that plan. And so we will have that as part of the plan. I do not have it today, but as we develop it, we will make sure we share it with you.

Senator HEINRICH. That was certainly the case when the Nuclear Weapons Center was the lead, and we just need to make sure that that does not fall by the wayside as we make this incredibly important transition.

General WILSON. Absolutely.

Senator HEINRICH. Thank you, General.

Senator SESSIONS. Senator King?

Senator KING. I just want to take a moment to thank all of you, Ms. Creedon especially and Dr. Brumer, for the work on the report, on the review. I think so often we sort of just keep going, and to every now and then to stop and think and analyze and review and have some strategy about where we are headed I think is very valuable. And I commend former Secretary Hagel for initiating it and for your carrying it out. And I can assure you that it is going to

help to guide our work and consideration. So just a thank you for that important work.

Senator DONNELLY. And I would just like to follow up what Senator King said to say thank you as well and to also let you know our goal is to simply make this all work the best possible and to create the most confidence in the people who work in this area, and that when we talk about these things, it is not to try to pick out people or pick on people. It is simply to say how can we do this better. What are the things we missed on? Just like the next day in practice, how can we run this better and make our team better? And so to all of you, thank you and thank you for your work on this effort.

Senator SESSIONS. Thank you, Senator Donnelly. And I agree with those positive comments. I really believe that the Defense Department took the challenge seriously. The report is a serious report, and I believe that you are determined to eliminate the dangers and problems that we had. I truly believe that is so.

Admiral Benedict, General Harencak mentioned the joint work that you have done. I understand there has been some real savings of money in that. And do you see possibilities in the future as we develop ICBM warheads and submarine-launched warheads that we could also have interoperable systems as the years go by?

Admiral BENEDICT. Yes, sir. And I think there is a spectrum of commonality. It goes from the simple constituents using the same materials in the weapon system all the way up through—you could envision at some point at least a discussion about how common could we be. Could we be a common missile? I am not certain we are at that far right side of the spectrum. But I will tell you that we are engaged at the engineering level, at the leadership level, and as I mentioned earlier, I am actually briefing the Air Force ICBM flags on Tuesday of next week with Admiral Haney on this very subject up in Cheyenne, Wyoming. And they were very generous to invite me up there to have the conversation on commonality.

So I think the conversation is ongoing. The recognition that the bill that you very well recognize that is in front of the two services is something that we have to think about differently, and I think there is a commitment now within the leadership teams to ensure that we provide you evidence that we have thought about it differently and some different proposals than the past.

I will turn it over to my colleagues.

General HARENCAK. I would say, Senator, that it is not a possibility. It is a certainty that we are going to do it because we just cannot do it any other way. People ask me all the time, well, how can we afford to do all this recapitalization and modernization. Well, one way we are going to afford to do it is we are going to do it in a new way. We are not going to do it the same way we did it in the 1960s and the 1970s and the 1980s and the 1990s. We are going to do it in a smarter, better, faster way. And that starts with making sure wherever we can leverage another service or what the U.S. Navy has done or vice versa, we are going to do it. So this is not a possibility. This is a new way of doing things that we are committed to, both our services. And it is probably the only way

we are actually going to be able to deliver the needed systems for our Nation in an affordable manner.

Senator SESSIONS. Well, thank you. I think those are encouraging comments.

Senator King?

Senator KING. I was just going to say amen, General. You got it right.

Senator DONNELLY. I would third that and then also say to General Wilson I understand you are moving to STRATCOM, And we want to thank you on behalf of the committee for all the help you have rendered to us and we hope to continue that relationship as we look forward.

And, General Harencak, we understand there is a new incoming A–10. During the ICBM cheating incident and modernization of the Air Force's nuclear mission, you have been proud to defend and advocate for the Air Force, and we appreciate that very much and we wish you the very best in your next position as well.

Senator SESSIONS. Dr. Brumer, this will be my final question. Secretary Hagel talked about a 10 percent need increase apparently. I believe Administrator Creedon has used $9 billion to $25 billion. That depends on the years. That might be even more.

First, does the 2016 request and the FYDP funding profile reflect that increase? So let me ask you that.

Dr. BRUMER. Yes. Thank you for that question, Chairman.

Indeed, as part of the PB 2016 build, we did bring the senior leadership detailed assessments of all of the budget options and how they addressed the review recommendations. The PB 2016 did add $8 billion across the FYDP. Early on, there were options to spend more money, but there were executability problems and the ability to spend the money efficiently. By the end of the FYDP, I believe it comes close to the 10 percent number.

Senator SESSIONS. So that is a figure you can live with?

Dr. BRUMER. Sir, it is an outcome of trying to balance a good faith effort to address the recommendations of the reviews, as well as trying to ensure that there is good use of Government resources to ensure that the money is well spent. It is something that I am comfortable with today, but we are very early on in the efforts to address the issues. I believe that this is something that will require years of sustained effort and sustained attention, and we intend to comprehensively review those decisions and the funding levels every year and if changes are needed in future budget requests, we will recommend them.

Senator SESSIONS. Well, I think that is the kind of answer you can give at this time and maybe no more than that. But we would like to see the Government do a little better than we normally do. We go for years under-investing and then sometimes we over-invest. And if we can get on a stable path that we can be confident would put us into a safe, secure, and modernized system that is reliable, then we want to do that. And we hope you will look for every way possible to keep that cost as reasonable as you can.

Anything else, gentlemen?

Thank you all. We are adjourned.

[Whereupon, at 4:10 p.m., the subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JAMES M. INHOFE

MODERNIZATION

1. Senator INHOFE. Major General Harencak, Lieutenant General Wilson, Vice Admiral Benedict, Dr. Brumer, and Ms. Creedon, do each of you believe our nuclear deterrence capability has been challenged by inadequate modernization funding and continued modernization by other nuclear powers?

Major General HARENCAK and Lieutenant General WILSON. As long as deficit reduction remains a national priority, federal agencies will continue to compete for diminishing resources. The modernization requirements across the entire Air Force have certainly created challenges, particularly for our efforts to simultaneously modernize the ICBM force, the dual-capable bomber fleets, and the intricate NC3 infrastructure.

In the five years since Air Force Global Strike Command stood up as a Major Command, both funding and manpower resources flowing to the nuclear mission have improved. However, significant work remains to correct 23 years of reduced nuclear focus and funding since standing down Strategic Air Command.

We must continue to balance fleet recapitalization with continuous operations and maintenance of a safe, secure, and effective nuclear force, which is our number one priority. This nuclear capability is foundational to US national security, acting as assurance to our allies and a deterrent to those who might choose to harm us.

Vice Admiral BENEDICT. Prioritizing limited resources to meet national strategic deterrence requirements among all our national defense requirements is a challenge. Today's fiscal environment is a concern as the Department of Defense (DOD) endeavors to sustain and modernize many central components of our strategic nuclear deterrent triad, the communications system that directs it and the underlying support structure.

The Armed Services are implementing the President's guidance for aligning U.S. security policies to the 21st century security environment. Although our nuclear arsenal is the smallest it has been since the late 1950s, today's nuclear forces are fully capable of meeting current strategic defense needs and are expected to serve the nation well into the middle of this century. However, the percentage of defense department spending on our nuclear forces and infrastructure has declined to only 2.5% of total DOD spending in 2013—an historic low.

Today our nuclear weapons and weapons systems are safe, secure and effective despite operating well beyond their originally designed life. Today our triad of nuclear forces is formidable and stands as an effective deterrent to strategic attack against the U.S. and our allies. However, this readiness cannot be sustained indefinitely. Recent reviews of our DOD nuclear weapons enterprise have revealed that it no longer has the margin of safety and reliability it once had. Consequently, the nation faces a substantive, multi-decade recapitalization challenge in which we must continue to invest. Our current and planned investments are significant compared to past expenditures in our strategic deterrent programs since 1992 yet are commensurate with the magnitude of the strategic deterrent mission which is not expected to markedly change for the foreseeable future. If we fail to sustain these investments we risk degrading the global stabilizing effect of a diverse, strong, and capable nuclear force. It is imperative we resource future sensor improvements; upgrades for nuclear command, control, and communications (NC3) capabilities; strategic delivery system recapitalization efforts; weapon life-extension programs and stockpile surveillance activities; and nuclear complex infrastructure modernization. Together these exceptionally important and necessary investments will ensure our triad of nuclear forces remains viable and credible not only to our own defense but to our allies defense as well.

Dr. BRUMER. I believe that aging systems, coupled with competing priorities and topline pressure, have put stress on the Department's ability to maintain adequate risk margin in the nuclear enterprise. If left unaddressed over a long period of time, this might have challenged our deterrent capability in the future. However, the Department is taking action to address these issues, and I do not believe that this has undermined our nation's ability to provide a robust deterrent, even in the face of modernization by other nuclear powers.

Ms. Creedon did not respond in time for printing. When received, answer will be retained in committee files.

2. Senator INHOFE. Major General Harencak, Lieutenant General Wilson, Vice Admiral Benedict, Dr. Brumer, and Ms. Creedon, do you all believe that the nuclear triad (strategic bombers, intercontinental ballistic missiles (ICBMs), and submarine-

launched ballistic missiles) is an essential deterrent and that each must be modernized and maintained?

Major General HARENCAK and Lieutenant General WILSON. Absolutely—the nuclear triad is as important today as it has been throughout its existence. In today's unpredictable world, our nuclear weapons provide the ultimate protection for the United States and our allies and partners. The three legs of the triad complement each other to provide quick response, visible deterrence, and survivability. If you remove any one of these capabilities, you risk increasing our vulnerability against the only existential threat our nation faces.

With respect to modernization, we must continue to modernize our existing systems while also developing new weapon systems. For decades we have taken a procurement break with respect to our nuclear weapon systems, but now that bill has come due. The Air Force is operating B–52s that were produced in the 1960s, ICBMs that were deployed in the 1970s, and B–2s and cruise missiles that were produced in the 1980s. We have upgraded these systems throughout the years; however, it becomes more and more expensive every time we do this. It is similar to maintaining an older car—there comes a point where it makes better financial and operational sense to simply buy a new one.

Our adversaries are publicly developing new systems and modernizing their existing ones—both offensive and defensive. This is not to say we are engaging in a new arms race. But it does mean other countries are developing systems that will eventually challenge our capability to strike anywhere on the globe at any time. We cannot risk these countries turning the Air Force into a regional force instead of a global one.

Vice Admiral BENEDICT. Per the 2010 Nuclear Posture Review (NPR), "retaining all three Triad legs will best maintain strategic stability at reasonable cost, while hedging against potential technical problems or vulnerabilities." The commitment to the triad was reinforced in the U.S. Nuclear Weapons Employment Planning guidance the President issued in June 2013. USSTRATCOM executes strategic deterrence and assurance operations with Intercontinental Ballistic Missiles (ICBMs), Ballistic Missile Submarines (SSBNs), and nuclear capable heavy bombers. Each element of the nuclear triad provides unique and complimentary attributes of strategic deterrence, and the whole is greater than the sum of its parts.

Ballistic Missile Submarines (SSBNs)

Recapitalizing our Sea-Based Strategic Deterrent (SBSD) is the Navy and USSTRATCOM's top modernization priority. The Navy's *Ohio*-class SSBN and Trident II D5 Strategic Weapons System (SWS) together are the nuclear triad's most survivable leg and are the assured response that is the core of our nuclear deterrent strategy. This stealthy and highly capable force is composed of two major elements, the SWS and delivery system. Both are undergoing needed modernization. With respect to the SWS, we are extending the life of the D5 system to be capable until after 2040. With respect to the submarine that delivers these missiles, the *Ohio*-class SSBN has already been extended from 30 to 42 years of service and no further extension is possible. Consequently, these submarines will start leaving service at the rate of one per year in 2027. It cannot be emphasized enough that the OHIO Replacement Program must stay on schedule. No further delay is possible. Continued and stable funding for the OHIO Replacement SSBN also supports our commitment to the United Kingdom to provide a Common Missile Compartment design, ensuring both their and our new SSBNs achieve operational capability on schedule.

Summary

The nuclear Triad is essential to the strategic defense of the United States, and each of the legs therein plays a critical and complementary role in supporting the other legs of the Triad. Removing any of these essential legs would threaten the credibility of our strategic deterrent capability the NPR directs the military to maintain and would thereby increase the risk of nuclear war.

Dr. BRUMER. The nuclear Triad is the basis for the nation's deterrence capability and a key aspect of our national security enterprise. Each leg brings unique characteristics, and the multi-system nature of the Triad ensures that our deterrent is robust even in the face of unexpected technical issues or advancements by other nuclear powers.

Ms. Creedon did not respond in time for printing. When received, answer will be retained in committee files.

3. Senator INHOFE. Lieutenant General Wilson and Vice Admiral Benedict, if the Air Force and Navy are forced to accept the levels of funding in the Budget Control

Act, what will the Air Force and Navy prioritize and what programs will be impacted?

Lieutenant General WILSON. Thank you for the question, but I must defer to Air Force and DOD leadership on service priorities under sequestration.

Vice Admiral BENEDICT. A return to sequestration in FY 2016 would necessitate a revisit and revision of the defense strategy. Sequestration would significantly reduce the Navy's ability to fully implement the President's defense strategy. The required cuts would force us to further delay critical warfighting capabilities, reduce readiness of forces needed for contingency responses, further downsize weapons capacity, and forego or stretch procurement of force structure as a last resort. Because of funding shortfalls over the last three years, our FY 2016 President's Budget represents the absolute minimum funding levels needed to execute our defense strategy. We cannot provide a responsible way to budget for the defense strategy at sequester levels because there isn't one.

Today's world is more complex, more uncertain, and more turbulent, and this trend around the world will likely continue. Our adversaries' are modernizing and expanding their capabilities. It is vital that we have an adequate, predictable, and timely budget to remain an effective Navy. Put simply, sequestration will damage the national security of this country.

PERSONNEL

4. Senator INHOFE. Lieutenant General Wilson and Vice Admiral Benedict, Ms. Creedon, what are we doing to ensure we can recruit and retain the right professionals, both military and civilian, to operate and sustain our nuclear forces?

Lieutenant General WILSON. The Air Force has launched several initiatives and is leveraging existing programs aimed at recruiting and retaining nuclear professionals. We are focusing on developing, training, educating, and incentivizing personnel through deliberate efforts.

In Air Force Global Strike Command, our education initiatives start at the commissioning sources and initial skills training. We have begun there so we can educate and inform current and future Airmen about the importance of the nuclear enterprise and how they contribute to that mission. We also send senior leaders to Reserve Officer Training Corps (ROTC) detachments around the country to engage students and inform them about the nuclear enterprise. We have done around 40 of these visits thus far, and have received great feedback.

Additionally, the Air Force dedicated resources to developing nuclear professionals through formal education and development programs that enhance knowledge and build perspectives on leadership. These courses educate and provide research on the nuclear enterprise, weapons of mass destruction threats, and appropriate countermeasures to Air Force and Department of Defense leaders.

One of these programs is the new School of Advanced Nuclear Deterrence Studies, where we will build a cadre of nuclear deterrence and assurance experts experienced in the concepts of leading, operating, maintaining, defending, supporting, planning, and sustaining the nuclear enterprise. The Air Force has also teamed with the Navy to create an exchange program for nuclear professionals. Moreover, there are Air Force sponsored fellowships and intern programs at the national nuclear laboratories used to further enhance our nuclear professionals' education, training, and development.

The Air Force has taken action to provide monetary and non-monetary incentives for nuclear specialties currently performing nuclear related duties to include support personnel. Monetary incentives include Assignment Incentive Pay for ICBM operators, security forces and maintenance officers, and Special Duty Assignment Pay for critical enlisted nuclear career fields. Also, the Air Force is offering a Selective Reenlistment Bonus for certain specialties unable to meet retention goals. For civilians, the Air Force has requested and been approved special salary rates and recruitment, retention, and relocation incentives to attract personnel to some of our hard to fill locations.

The intent of all these efforts is to meet the objective of attracting, and retaining nuclear professionals through education, training and developmental initiatives.

Vice Admiral BENEDICT. Navy recruits, and eventually commissions or enlists, only highly-qualified and trusted candidates who possess the emotional stability and physical capability, and who demonstrate the reliability and professional competence, essential to maintaining the most advanced and sophisticated weapons systems in the world. Our future officers commission through the U.S. Naval Academy, Naval Reserve Officer Training Corps units at some of the nation's premier educational institutions, or through various other colleges and universities under the

Nuclear Propulsion Officer Candidate (NUPOC) program. Enlisted personnel are selected from among Navy applicants who achieve the highest scores on the Armed Services Vocational Aptitude Battery (ASVAB). The chosen few must maintain certification in, and be continuously evaluated through, the Nuclear Weapons Personal Reliability Program, and must remain eligible at all times for the required levels of security clearance and access.

Navy uses various special and incentive pays and bonuses to attract and retain intelligent, highly-motivated and uniquely-qualified officers and enlisted personnel assigned to the nation's nuclear deterrent mission, in submarines or in the Fleet Air Reconnaissance Take Charge and Move Out (i.e., VQ (TACAMO)) mission. In addition to competitive compensation, we invest substantial effort in educating Sailors on the benefits of this unique service, which includes the opportunity and honor of serving our nation in this unique arena, and exposure to world-class training and challenging duty assignments, eligibility for Post-9/11 GI Bill benefits and access to continuing education, family support programs and world-class health care, while qualifying for tax advantages and, potentially, a generous retirement plan.

In the civilian workforce, the Strategic Systems Program (SSP) office uses available hiring flexibilities, including Expedited Hiring Authority to access highly-qualified acquisition employees, and various Veterans' Recruitment Appointments (VRA) to quickly hire qualified veterans into civilian jobs. We offer Tuition Assistance and Student Loan Repayments to encourage employees to remain in SSP throughout their careers. We also provide retention incentives to employees in critical skills, and have been successful in hiring new employees to fill job vacancies and in retaining the needed skills to do the mission.

Last fall, CNO initiated a Nuclear Enterprise Manpower Review to assess military and civilian manpower requirements across the nuclear weapons and nuclear propulsion enterprises to identify gaps in mission execution. The current phase of the review will provide gap analyses across all force management domains late this summer. The next phase will focus on competency management requirements for federal civilian employees and recommend significant improvements in community management and knowledge development practices.

Ms. Creedon did not respond in time for printing. When received, answer will be retained in committee files.

QUESTIONS SUBMITTED BY SENATOR JOE DONNELLY

NAVAL SURFACE WARFARE CENTER CRANE VALUE

5. Senator DONNELLY. Vice Admiral Benedict, can you characterize the role Naval Surface Warfare Center (NSWC) Crane plays in support our Navy nuclear forces?

Vice Admiral BENEDICT. For more than 50 years, NSWC Crane's Global Deterrence and Defense Department has provided product engineering and design capabilities for shipboard and flight electronics in support of a vast array of missile systems for the Navy. Strategic Systems Programs has relied on their expertise to ensure generations of Fleet Ballistic Missile systems were developed and continue to be deployed in support of our nation's strategic deterrence mission. NSWC Crane has played a critical role in each of the missile subsystems, including the system and platform integration of the Strategic Weapons System.

They are also active participants in the Commonality efforts, led by the Navy and Air Force. NSWC Crane is currently leading the effort to develop a radiation hardened parts library for use by the Navy, Air Force, and other Defense Department customers. The database will serve as a repository for all current radiation hardened parts including the manufacturer, specifications, and test results.

RADIATION-HARDENED PARTS AND HARDWARE ASSURANCE

6. Senator DONNELLY. Vice Admiral Benedict, as you know, NSWC Crane is at the center of work on radiation-hardened electronics and hardware assurance efforts. Their work on detecting and protecting against counterfeit parts entering the Department of Defense (DOD) supply chain is groundbreaking. What is the Navy doing to protect nuclear systems against counterfeit parts and how can we better leverage expertise like that at Crane to counter this threat, whether in the Navy or elsewhere?

Vice Admiral BENEDICT. SSP and our Prime Contractors relied on NSWC Crane's expertise relative to detecting and protecting against counterfeit parts entering the Navy's TRIDENT II (D5) life extension program during the development phase and continuing into the production phase. Specifically we utilized an approved DMEA

Trusted foundry, monitored the electronic parts' and printed circuit boards' supply chain, made procurements through OEMs and only if an OEM would not sell product directly did we procure through an OEM authorized distributor. In addition, we utilized NSWC Crane as an independent test agent to perform physical and functional verification of critical components.

NSWC Crane's expertise in this area was highlighted during the recent Microelectronics Integrity Meeting hosted at NSWC Crane. The meeting was attended by several key DOD claimants. Continuing this type of engagement will help the DOD leverage NSWC Crane's expertise and allow the best practices of all of DOD to be highlighted.

7. Senator DONNELLY. Lieutenant General Wilson, I am aware that NSWC Crane is working with the Defense Advanced Research Projects Agency (DARPA), the National Security Agency (NSA) and the Air Force on efforts to better understand and protect against counterfeit parts entering the DOD supply chain. Whether in relation to this partnership or separately, can you explain how the Air Force is working to protect its nuclear systems against counterfeit parts?

Lieutenant General WILSON. The Air Force is continuing work to comply with current and past Congressional language in response to new and emerging threats in the context of the supply chain. We continue to protect the nuclear enterprise supply chain through a multi-tiered approach of prevention, detection, and mitigation. This includes policy, oversight, direction, and actions ranging from the Secretary of the Air Force for Acquisition (SAF/AQX); Headquarters, Air Force Materiel Command (AFMC); the Air Force Nuclear Weapons Center (AFNWC); the specific weapons system program offices; and the Air Force Supply Chain Manager (448th Supply Chain Management Wing). The Air Force is also working in cooperation with other military services, offices, laboratories, and partners in industry and academia. Through coordination efforts between these various organizations, activities involving the identification, threat assessment, planning, surveillance, detection, and mitigation of counterfeit parts are performed.

The Air Force controls weapon systems' parts from concept, design and development, and operational fielding phases through final weapon system disposal by developing and updating rigorous sets of technical requirements, specifications, standards, and key suppliers and support infrastructure. As systems move into sustainment and become more mature, changes in requirements and suppliers drive Air Force and Defense Logistics Agency (DLA) reviews of technical data, supplier qualification, and test parameters to ensure technical compliance of parts. Many items require qualification, first article, and production lot sampling and testing.

As older trusted sources go out of business, outsource, consolidate/merge or opt to no longer produce the parts we need, there is an increased threat of counterfeit parts entering our supply chain. The Air Force and DLA are driven to require more surveillance including such things as visual and physical inspection, x-ray analysis, deconstruction, software, quarantine, and marking of parts. Additionally, the Air Force uses their Discrepant Material Reporting Office (DMR) and the Government-Industry Data Exchange Program (GIDEP) to react to identified risks.

As a part of a weapon system's longer sustainment process, the Air Force conducts a series of review processes to ensure parts are compatible and pass rigorous testing requirements. Additionally, the Air Force Supply Chain protects against counterfeit parts by developing tools and capabilities to detect counterfeits, and ensuring contractors have detection programs in place.

The Air Force Supply Chain office actively continues to coordinate efforts with AFNWC, specific program offices, Air Force Office of Special Investigations (AFOSI), Intelligence Offices, higher headquarters, and the other military services and DOD agencies for future planning and mitigation efforts, as well as holding collaborative working groups.

Furthermore, the Air Force Nuclear Weapons Center (AFNWC) has specific Supply Chain processes and efforts underway to identify mission critical functions and critical components, and has developed implementation strategies to reduce vulnerabilities through a systems security engineering approach and by independently assessing vulnerabilities of AF strategic systems across the lifecycle of the weapon systems against current and emerging threats. AFNWC, in coordination with the National Nuclear Security Administration (NNSA), is also establishing a Joint US/UK Supply Chain Assurance Working Group (JSCAWG). The purpose of the JSCAWG is to provide a joint US–UK coordination and communication forum for supporting trust and confidence in the respective US and UK nuclear weapon supply chains and in Information Technology systems (to include hardware and software).

Finally, DLA employs an enhanced quality control program to protect Air Force ICBM systems from counterfeit/nonconforming parts. Key elements of the program include: tracking and managing ICBM parts separately from other parts; procuring ICBM parts to the specifications identified by the Air Force; employing high level quality assurance standards and requirements when procuring AF ICBM parts; conducting parts tests; and leveraging anti-counterfeiting technology to validate the authenticity of all microcircuits purchased by DLA.

8. Senator DONNELLY. Ms. Creedon, I am aware that NSWC Crane is working with DARPA, NSA, and the Air Force on efforts to better understand and protect against counterfeit parts entering the DOD supply chain for both our nuclear and conventional systems. Whether in relation to this partnership or separately, can you explain how NNSA is working to protect our nuclear systems against counterfeit parts?

Ms. Creedon did not respond in time for printing. When received, answer will be retained in committee files.

NAVY-AIR FORCE COLLABORATION/COMMONALITY

9. Senator DONNELLY. Vice Admiral Benedict, following up on my question in the hearing, NSWC has been involved in efforts to enhance collaboration and/or commonality among Navy and Air Force nuclear programs. At one time, we heard talk of Air Force-Navy collaboration. Today we hear more about commonality. How would you characterize each of these aims?

Vice Admiral BENEDICT. As viewed by the Navy, Commonality and Collaboration should cover and examine a large spectrum of potential effort. This spectrum covers areas from Sustainment of Current Systems (continuing MMIII and D5LE in their current forms) through "Evolution" (Air Force and Navy coordinated programs of joint components and constituents) to "Revolution" (i.e. Joint Ballistic Missile). The goal of the Commonality and Collaboration efforts between the Navy and Air Force is not entirely focused at the one extreme of building a common SLBM/ICBM, but more likely would utilize certain elements of each system that have the potential for being common. The full option space must be explored from a National perspective to ensure the correct balance of commonality.

Although commonality and collaboration are often used interchangeably as if they are a single effort, they are different. Collaboration focuses on what each service is doing and trying to coordinate and consolidate those efforts that are similar. Commonality focuses on working efforts in the same manner, either by using the same components or the same facilities. The radiation hardened electronic parts library is a great example that addresses both collaboration and commonality. The library itself is a collaborative effort used by both services. In the future before developing or certifying a new part, both sides will aim to use the parts already included in the library—a commonality effort.

10. Senator DONNELLY. Vice Admiral Benedict, you spoke briefly in the hearing about the status of efforts to achieve commonality among Navy and Air Force nuclear systems. I request that your staff brief mine on the status of these efforts in detail, including current efforts and opportunities for the future.

Vice Admiral BENEDICT. I have a brief ready and it can be scheduled at your convenience. My POC CAPT Tyler Meador can be reached at 703–697–2871 or *tyler.meador@navy.mil* or Ms. Meghan Raftery at 202–433–7105, *meghan.raftery @ssp.navy.mil.*

11. Senator DONNELLY. General Harencak and Lieutenant General Wilson, I request that your staff brief my office in detail on the status of efforts to enhance collaboration and commonality across Air Force and Navy nuclear programs, including current efforts and opportunities for the future.

Major General HARENCAK and Lieutenant General WILSON. We look forward to briefing you on different ways in which the Air Force and Navy are working together to ensure commonality.

12. Senator DONNELLY. Ms. Creedon, what is your assessment of efforts to enhance collaboration and commonality across Navy and Air Force nuclear programs? Do you see value in such efforts and what are the challenges and opportunities now and in the future?

Ms. Creedon did not respond in time for printing. When received, answer will be retained in committee files.

QUESTION SUBMITTED BY SENATOR MARTIN HEINRICH

LONG RANGE STAND OFF

13. Senator HEINRICH. Lieutenant General Wilson, in your testimony, you state that the Air Force "fully intends to develop a conventional version of the Long Range Stand Off (LRSO) Weapon as a future spiral to the nuclear variant". Does this mean that once the current program becomes a program of record and achieves Milestone A it will have the conventional version as part of its requirements for engineering past Milestone B, or will the Air Force come back to it later after they develop the nuclear version of LRSO?

Lieutenant General WILSON. We do, in fact, intend a conventional variant of the Long Range Standoff weapon. However, currently, the main focus for LRSO is to develop the nuclear variant while ensuring the program is achieving the initial developmental guidelines. Upon successful development of the nuclear LRSO variant, Air Force Global Strike Command will pursue a conventional variant following the Joint Capabilities Integration & Development System process by evaluating alternatives and codifying any conventional variant requirements in a JROC validated capabilities document.

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