

Statement of
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Under Secretary of Defense for
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Before the
Strategic Forces Subcommittee
Committee on Armed Services
United States Senate

U.S. Nuclear Weapons Policy, Programs, and Strategy
in Review of the Defense Authorization Request for Fiscal Year 2020
and the Future Years Defense Program

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Chairwoman Fischer, Ranking Member Heinrich, and distinguished members of the Subcommittee, thank you for the opportunity to testify today on U.S. Nuclear Weapons Policy, Programs, and Strategy and the Fiscal Year (FY) 2020 Budget Request. I am pleased to join Deputy Under Secretary of Defense for Policy David Trachtenberg, General Timothy Ray, and Vice Admiral Johnny Wolfe to discuss the Department of Defense's (DoD) highest priority: ensuring that the United States has a safe, secure, reliable, and credible nuclear deterrent now and in the future.

Role of Acquisition and Sustainment in DoD's Nuclear Enterprise

I am here today representing the entire DoD Acquisition and Sustainment (A&S) team of thousands of dedicated military, civilian, and contractor professionals who execute the A&S mission every day. As Under Secretary, I am responsible for leading the Department's efforts to both sustain and modernize the nation's nuclear weapon delivery systems and related nuclear command, control, and communications (NC3) systems.

To enable these efforts, I chair the Nuclear Weapons Council (NWC) and the Defense Acquisition Board, co-chair the Council on Oversight of the National Leadership Command, Control, and Communications System (CONLC3S), and have been designated DoD's NC3 Enterprise Capability Portfolio Manager. I also serve as the Defense Acquisition Executive and the Milestone Decision Authority (MDA) for all of the major nuclear modernization acquisition programs. In addition, A&S has three Assistant Secretaries focused on Acquisition, Sustainment, and Nuclear, Chemical, and Biological Defense Programs. These and other roles and responsibilities of the Under Secretary for A&S put our organization at the center of a complex and integrated set of programs that must be executed successfully to ensure the long-term credibility of our nuclear deterrent.

2018 Nuclear Posture Review and Today's Nuclear Threat Environment

For more than 70 years, U.S. nuclear forces have deterred our adversaries, assured our allies, and helped prevent competition among the Great Powers from escalating into large-scale conflict. For much of that history, this mission has been underpinned by the strategic nuclear triad consisting of ground-based intercontinental ballistic missiles (ICBMs), ballistic missile submarines (SSBNs) armed with submarine-launched ballistic missiles (SLBMs), and nuclear-capable bombers. For decades, Republican and Democratic administrations alike have recognized the critical importance of the nuclear triad for keeping the peace.

The 2018 Nuclear Posture Review (NPR) reaffirmed the need to maintain the triad and other longstanding, bipartisan views on U.S. nuclear posture and took a clear-eyed look at the nuclear threat environment we face today and are likely to face in the future. The 2018 NPR recognized that, while the U.S. has spent the decades since the end of the Cold War both reducing the size of the U.S. nuclear stockpile and the role of nuclear weapons in our defense strategy, Russia and China have gone—and continue to go—in the other direction. Our potential adversaries are actively increasing the role of nuclear weapons in their strategies and increasing the size and sophistication of their nuclear forces.

For instance, Russian President Vladimir Putin publicly announced last year that Russia is actively developing and testing entirely new nuclear capabilities such as a nuclear-powered, nuclear-armed cruise missile and a nuclear-powered, nuclear-armed transoceanic underwater vehicle. Russia also is modernizing and expanding its arsenal of approximately 2,000 non-strategic nuclear weapons, including nuclear torpedoes, nuclear air and missile defense interceptors, nuclear depth charges, nuclear landmines, and nuclear artillery shells—more than a dozen types. Russia’s public statements and nuclear threats, its deployment of systems in direct violation of the Intermediate-Range Nuclear Forces Treaty, its well-documented and well-rehearsed military doctrine to use nuclear weapons to “de-escalate” a conventional conflict, and its military resourcing decisions make clear that Russian leaders have not followed the United States’ post-Cold War lead with respect to nuclear weapons.

China also continues to expand and diversify its nuclear forces. China is modernizing its full array of nuclear missile forces, is deploying sea-based weapons, and has announced their intent to form a nuclear triad by developing a nuclear-capable, next-generation bomber. North Korea’s nuclear capabilities also threaten our homeland and our allies and add to an already complex strategic picture.

As outlined in the NPR and National Defense Strategy, we must now face the reality of growing nuclear threats coupled with the reemergence of Great Power competition as a driving force in world affairs. After 25 years of primarily drawing down and sustaining the nuclear forces we built during the Cold War, repeated decisions to defer recapitalization of our nuclear forces have caught up to us. Now, we must concurrently acquire and field modern systems in each leg of the strategic nuclear triad—and in our non-strategic nuclear forces—while also sustaining our aging legacy systems until modernized systems are available. We must also

reinvigorate our science, technology, and innovation base to ensure that the investments we are making in our forces lead to the greater flexibility, adaptability, and resiliency called for by the NPR.

Although still militarily effective today, the U.S. nuclear deterrent remains dependent on nuclear delivery and NC3 systems that were mostly fielded in the 1980s or earlier. Through the Services, DoD is sustaining these legacy nuclear forces until they can be replaced by modern systems. While these sustainment efforts have allowed us to defer investments for many years, we have reached a point where delay is no longer an option. Nearly all of the systems that comprise the current force are well beyond their originally designed service lives and will reach the end of their sustainability in the 2025 to 2035 timeframe. The United States must make a choice: either we continue to invest in modernizing and replacing these systems or we accept the loss of our ability to deter the most severe threats to our nation and our allies and partners.

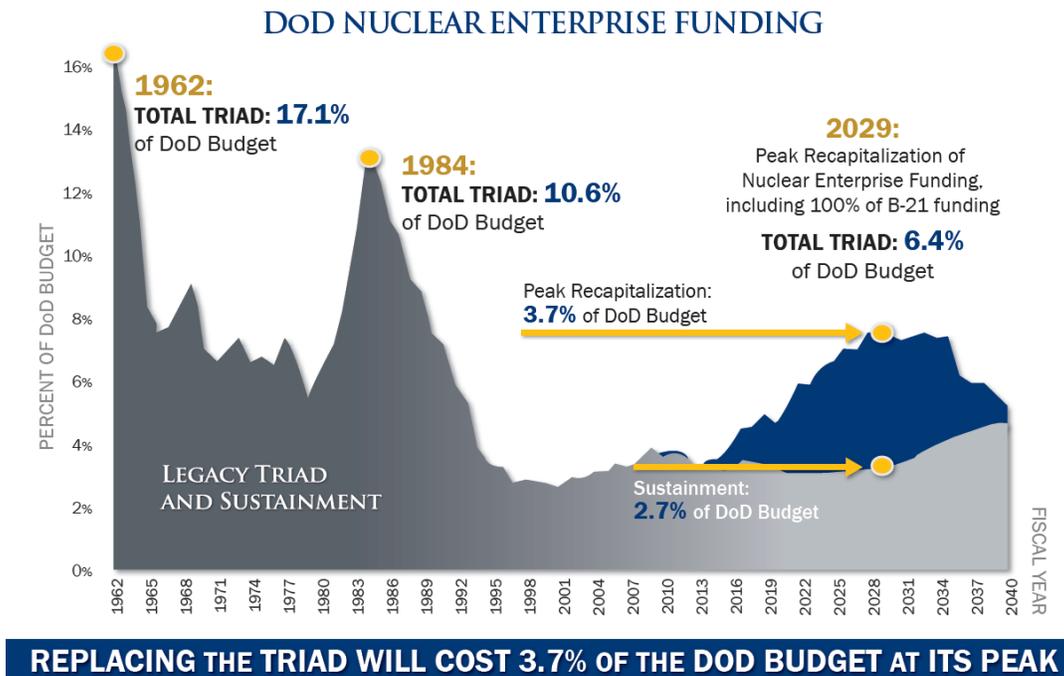
Summary of FY 2020 Budget Request for Nuclear Forces

The FY 2020 budget request for DoD nuclear forces is consistent with this urgency and is designed to address the risks we face across our nuclear enterprise. It funds the sustainment of our legacy forces and provides the necessary funding to continue modernizing them. In total, the FY 2020 budget request includes \$24.9 billion for nuclear forces, or 3.5% of DoD's budget. This includes \$8.4 billion for recapitalization and modernization and \$16.5 billion for operations and sustainment.

Because nuclear deterrence is DoD's number one priority mission, nuclear modernization programs are our highest investment priorities. As these programs mature in the coming decade, the funding they require will increase—the cost to recapitalize strategic delivery systems and NC3 is expected to peak at approximately 3.7% of the annual DoD budget in 2029 before decreasing again. When added to the relatively flat sustainment expenses, the total projected cost of sustaining and modernizing our nuclear forces will peak at approximately 6.4% of the DoD budget in the late-2020s. DoD is mindful of the sustained financial commitment ahead of us and gratefully recognizes the ongoing support Congress and the American people provide for this most important mission.

The cost of this effort is significant but manageable. As seen in the figure below, from a historical perspective, it is less expensive in relative terms than previous nuclear recapitalization programs. Comparatively, previous rounds of nuclear modernization during the Cold War cost

the nation 10.6% of DoD’s annual budget in the 1980s, and 17.1% in the 1960s. Measured against the catastrophic consequences of a major conflict or nuclear war, the cost of nuclear modernization is one we can afford to bear. As former Secretary of Defense Mattis said, “America can afford survival.”



Nuclear Forces Modernization and Sustainment of Legacy Systems

Ballistic Missile Submarine Force

The sea-based leg of our nuclear triad consists of 14 OHIO-class SSBNs armed with Trident II (D5) SLBMs. Originally designed for a 30-year service life, our OHIO-class submarines have already undergone a service life extension to prolong their lifespan to 42 years. The Navy will continue to operate and sustain the fleet out to 2040, but further service life extensions of the OHIO-class are not possible. In addition to hull fatigue and nuclear reactor life limitations, in the coming decades advances in our adversaries’ anti-submarine warfare capabilities require us to develop and field a modern submarine fleet.

To maintain the effectiveness of the submarine force, the Navy is developing the COLUMBIA-class SSBN—a next-generation strategic deterrent platform expected to serve until 2084. COLUMBIA will take advantage of new technologies, such as a life-of-ship reactor core. Without the need to ever refuel, these ships will need less time in overhaul and therefore enable

the Navy to meet the same deterrence requirements while reducing the fleet size from 14 to 12. This alone will lead to many billions of dollars in acquisition and operating cost savings. Additional improvements will ensure that COLUMBIA remains survivable in future threat environments, while design flexibility will allow for future upgrades. The COLUMBIA program is currently in the engineering and manufacturing development (EMD) phase, and advanced procurement began in FY 2018. Production of the lead ship of the class is expected to begin in the first quarter of FY 2021. The FY 2020 budget request for COLUMBIA totals \$2.2 billion.

The Navy is extending the life of the Trident II (D5) Strategic Weapons System (SWS) to match the OHIO-class submarine service life and to serve as the initial SLBM for the COLUMBIA-class SSBN. This is being accomplished through an update to all SWS subsystems: launcher, navigation, fire control, guidance, missile, and reentry. Two major components of this effort are the D5 Life Extension (D5LE) missile and Shipboard System Integration (SSI) Program. The Navy deployed 24 life-extended (D5LE) missiles in FY 2018 and remains on track to complete deployment by FY 2024. The SSI program refreshes shipboard electronics hardware and upgrades software to enable extended service life, efficient and affordable maintenance and continues to provide the highest level of nuclear weapons safety. The Navy completed 16 installations in FY 2018—7 more are scheduled to be completed this year.

ICBM Force

For the ground-based leg of the triad, the Air Force is concurrently sustaining 400 deployed Minuteman III (MM III) ICBMs and developing their replacements, the Ground Based Strategic Deterrent (GBSD) weapon system. The MM III has been in service since 1970 and has been life extended several times. When it is finally retired, after 2030, it will be the longest serving ICBM in history. For sixty years, MM III will have played a central role in our nuclear triad by providing a highly responsive capability that complicates adversary attack planning and decision making. However, U.S. Strategic Command has noted that as it reaches its end of life, MM III will face a more challenging threat environment that will make it increasingly difficult for the missile system to effectively hold targets at risk. MM III will also contend with attrition issues due to required testing and the aging and obsolescence of key missile components.

GBSD addresses the problems of MM III aging, attrition, and declining capability. The GBSD program is a comprehensive effort to replace the missile system, weapon system

command and control, and ground systems—as well as convert, modernize, or replace aging MM III infrastructure. Beginning with its initial deployment in 2028, GBSD will provide improved capability versus the legacy MM III, and ensure the ICBM force remains safe, secure, effective, and reliable out to 2075.

The GBSD program is currently in the Technology Maturation and Risk Reduction (TMRR) phase, with two prime contractors competing over the next year to address risk and develop the most cost-effective solution to meeting military requirements. The FY2020 budget request includes \$678 million of RDT&E and MILCON funding for the continued development of the GBSD weapon system. By the end of FY 2020, the program plans to complete its TMRR Preliminary Design Review, conduct a Milestone B review, and award the contract for the EMD phase of the program.

Bomber Force

The airborne leg of the triad is currently comprised of B-52H bombers capable of delivering nuclear-armed air-launched cruise missiles (ALCMs) and B-2A bombers capable of delivering nuclear gravity bombs. To sustain this most visible and flexible leg of the triad and maintain its effectiveness in a threat environment characterized by continuously improving adversary air defenses, the Air Force is carrying out multiple modernization programs to extend the service lives and improve the capabilities of these aircraft. For instance, the B-52 fleet is scheduled to receive new engines as part of the B-52 Commercial Engine Replacement program—this will be the first engine replacement for the B-52 since its introduction in 1962. B-52Hs will also receive an upgraded radar through the Radar Modernization Program and an improved communications and mission management system known as Combat Network Communications Technology (CONNECT). CONNECT will provide an integrated communication and mission management system with a machine-to-machine interface for weapons targeting and will enable greater weapons carriage flexibility.

Similarly, the B-2A fleet will receive upgrades to multiple systems, including the Defensive Management System (to ensure its ability to operate in highly contested environments) and its Stores Management Operational Flight Program software (to enable the aircraft to use advanced digital weapon interfaces and allow carriage of the B61-12 nuclear gravity bomb).

To supplement—and eventually replace—the legacy bomber force, DoD is developing a modern, long-range, penetrating bomber. The B-21 Raider will give the Air Force a highly-survivable conventional and nuclear-capable bomber that ensures the ability to penetrate advanced air defense systems in an anti-access/area denial environment well into the future. The Air Force plans to acquire a minimum of 100 B-21s, with the first expected to enter service in the mid-2020s. B-21 is currently in the EMD phase and is transitioning to the development of the first test aircraft. The FY 2020 budget request includes \$3 billion for the program.

DoD is also sustaining the nuclear-armed AGM-86B ALCM, first introduced in the early 1980s, until it can be replaced by the Long Range Standoff (LRSO) weapon in the early 2030s. Developed to allow the B-52H to execute its deterrent missions while remaining safely outside the range of adversary air defenses, the ALCM has already undergone multiple service life extensions to keep it operational well beyond its original 10-year design life. As it ages, ALCM will face continuously improving adversary air defenses, as well as challenges to weapon system sustainment caused by out-of-production parts and limited supplies.

LRSO will be a modern, nuclear-armed, air-launched cruise missile capable of penetrating advanced integrated air defenses. Once deployed, LRSO will be carried by both the B-52H and upcoming B-21 bombers. LRSO will be the first simultaneous development of a missile and nuclear warhead in more than 30 years. The LRSO program is currently underway, with two contractors currently performing work under TMRR contracts. The FY 2020 budget request includes \$713 million in RDT&E funding to continue development of the missile and fund initial aircraft integration efforts.

Dual-Capable Aircraft

In addition to the three legs of the strategic nuclear triad, the U.S. maintains a force of dual-capable tactical aircraft (DCA), capable of delivering nuclear-gravity bombs. This “non-strategic” nuclear capability enhances deterrence and assurance by providing an ability to forward-deploy U.S. nuclear forces around the globe and demonstrate to allies and adversaries alike that U.S. nuclear forces are prepared to defend U.S. interests and those of our allies and partners. Today, DCA missions are fulfilled by U.S. F-15E aircraft, as well as aircraft provided by several NATO allies, capable of carrying B61-3/4 nuclear gravity bombs.

To replace the F-15E in the DCA role, the U.S. is developing DCA capability for the F-35A—which several of our NATO allies will also fly for the Alliance’s nuclear deterrence

mission. Fifth-generation F-35 DCA will ensure U.S. and NATO allies retain the ability to penetrate advanced air defenses long into the future. The FY 2020 budget request includes \$71.3 million for the F-35A DCA program, with the program planning to complete software development, separation flight testing, and mission system flight testing during the fiscal year.

Similarly, the B61-3/4s carried by our DCA are being modernized to the B61-12, which is scheduled to replace several B61 variants currently in service. The B61-12 Life Extension Program is a joint effort between DoD and the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). In this program, DoD is responsible for development of a guidance-capable tailkit assembly (TKA), aircraft integration, and all-up round integration, while NNSA is responsible for the bomb assembly. Production of the B61-12 TKA is underway and Milestone C was achieved in the first quarter of FY 2019. The FY 2020 budget request includes \$108.3 million for the program.

Sea-Launched Cruise Missile

The NPR directed DoD to pursue a modern, nuclear-armed, sea-launched cruise missile (SLCM) to supplement the triad and DCA. The SLCM will provide a regional, non-strategic nuclear capability and will help address both Russia's arms control violations and the major imbalance between Russian and U.S. non-strategic nuclear capabilities. This program will leverage existing technologies wherever possible to ensure cost effectiveness and will require close coordination with NNSA. The FY 2020 budget request includes \$5 million to support an analysis of alternatives for the SLCM.

NC3

Underpinning our entire nuclear deterrent is a complex and resilient NC3 system that must always connect the President to our nuclear forces—even under the most stressful circumstances. The NC3 portfolio comprises a complex architecture of more than 200 systems that allow detection of threats, support decision making, and enable force direction.

Our NC3 system is reliable and effective in supporting today's nuclear deterrence requirements, but it is largely based on 20th century technologies developed during the Cold War. Modernization is essential to meet modern threats, especially in cyberspace. As DoD's NC3 Capability Portfolio Manager, I work closely with General Hyten, in his capacity as the NC3 Enterprise Lead, to sustain the systems we have while working to develop and field new capabilities across the domains of space, air, and land.

Space-based communications systems play—and will continue to play—a vital role in our NC3 architecture. As with other operating environments, space is increasingly contested and potentially a warfighting domain. Satellite systems operating in the extremely high frequency range, with their ability to communicate through severe nuclear radiation environments, are essential to ensuring resilient communications. The existing Military Strategic and Tactical Relay (Milstar) satellite constellation is long past its planned life. To replace and enhance Milstar capability, there are currently four Advanced Extremely High Frequency (AEHF) satellites in orbit with two additional satellites set to launch by 2020. The FY 2020 budget request includes \$149 million in total funding for AEHF. DoD is developing a number of airborne and land-based satellite terminals to take advantage of this new AEHF constellation. For instance, the Family of Beyond Line of Sight Terminals (FAB-T) program is developing force element and command post terminals to provide the resilient communications necessary to link senior national leaders together with each other and with our nuclear forces. The FY 2020 budget request includes \$198 million in RDT&E for FAB-T.

In the air domain, the NC3 system currently relies on E-4B and E-6B aircraft to act as alternate command posts and communications relays to help direct our nuclear forces. These aircraft date to the 1970s and 1980s and also require recapitalization. An analysis of alternatives is underway to replace these systems in the early-2030s with newer, more capable, and more sustainable platforms. Additionally, DoD is developing a common Very Low Frequency (VLF) receiver that, when fielded, will replace aging communications systems on our B-52H and B-2A bomber fleets that are challenged by a vanishing vendor base.

Finally, in the land domain, the Air Force's Global Aircrew Strategic Network Terminal (Global ASNT) is being developed to modernize our survivable communications links between the President and certain elements of the nuclear enterprise such as Wing Command Posts, bomber and tanker Mobile Support Teams, and more. Global ASNT will replace the Single-Channel, Anti-Jam, Man-Portable (SCAMP) system, which is based on 1980's technology. The FY 2020 budget request includes \$123 million for Global ASNT Increment 2.

Nuclear Weapons Council and Alignment with NNSA

As statutory chair of the Nuclear Weapons Council (NWC), the Under Secretary for A&S has responsibility for not only sustaining and modernizing DoD's nuclear forces but also ensuring those activities are synchronized with their associated nuclear warhead development

programs managed by NNSA. The NWC is a joint DoD and DOE/NNSA governance body established to facilitate alignment and coordination—and establish priorities—as the two Departments fulfill their shared responsibility for providing the nation’s nuclear deterrent. The NWC continually seeks to guide and balance the many programs needed to maintain our existing nuclear weapons stockpile while also modernizing it. We also review, coordinate, and help set requirements that drive capability and capacity decisions at NNSA, which is particularly important as NNSA recapitalizes its nuclear weapons production infrastructure—much of which dates to the 1950s and 1960s or earlier.

Regarding capability and capacity, the 2018 NPR re-confirmed, and the NWC supports, NNSA’s efforts to establish a responsive enterprise capable of designing and producing the nuclear weapons DoD needs to deter conflict and assure allies. This includes rebuilding NNSA’s strategic materials production and processing capabilities for plutonium, uranium, lithium, and tritium—as well as key capabilities for the design and manufacture of strategic radiation hardened microelectronics. While all these materials and capabilities are important to sustaining confidence in the U.S. nuclear stockpile, pit production is a lynchpin. Funding to support implementing the pit production capability needed to meet DoD’s requirements lowers risks associated with the aging of plutonium in existing pits and provides the ability to respond to potential challenges, caused by renewed strategic competition, in a timely fashion.

A responsive enterprise also includes ensuring NNSA has a world-class workforce capable of responding to the dynamic and uncertain nuclear future we face. With the reemergence of Great Power competition and increasing nuclear threats, it is important to ensure NNSA’s workforce and infrastructure are prepared to provide a credible, flexible, and modern deterrent that can adapt to change and emerging requirements in a timely manner. As the Secretary of Defense’s preface to the NPR stated:

“Recapitalizing the nuclear weapons complex of laboratories and plants is also long past due; it is vital we ensure the capability to design, produce, assess, and maintain these weapons for as long as they are required. Due to consistent underfunding, significant and sustained investments will be required over the coming decade to ensure that National Nuclear Security Administration will be able to deliver the nuclear weapons at the needed rate to support the nuclear deterrent into the 2030s and beyond.”

The NWC regularly convenes to synchronize efforts between DoD and NNSA on the vision, strategy, and execution of nuclear programs. Similar to the challenges faced by aging

nuclear delivery systems in DoD, the nuclear weapons produced and sustained by NNSA continue to age—with many well-beyond their originally expected service lives. DoD and the NWC support NNSA’s nuclear weapon life extension programs (LEP), Stockpile Stewardship Program, and Stockpile Responsiveness Program. Collectively, these programs enable sustainment of the current nuclear weapons stockpile, improved understanding of aging effects in the stockpile, and prepare NNSA’s enterprise for the future. For example, NNSA’s Stockpile Responsiveness Program is an important means to develop and retain the next generation of world-class scientists and engineers that NNSA needs. It also allows NNSA to explore and mature technologies for potential insertion into future LEPs, exercise critical design and production skills, and develop options for responding to emerging threats.

NPR Implementation and Nuclear Enterprise Review Follow-up

NPR Implementation

The 2018 NPR confirmed the findings of previous NPRs that the diverse capabilities of the nuclear triad provide the flexibility and resilience needed for deterrence in the most cost-effective manner. To turn the NPR’s policy direction into action, A&S has been leading and supporting a variety of implementation activities.

For instance, the NWC took quick action to respond to the NPR’s tasking to develop and field a low-yield, submarine-launched ballistic missile, completing necessary reviews and authorizations to enable NNSA to build a first production unit of the W76-2 warhead just 12 months after the NPR was released. The NWC has also reviewed requirements related to the nuclear-armed SLCM directed by the NPR, and NWC stakeholders are engaging to support the analysis of alternatives related to that weapon.

More long-term, the NWC has published a FY 2019 – 2044 Strategic Plan, which will help guide efforts to align programs related to nuclear delivery platforms, warheads, and infrastructure. And more broadly, A&S continues to assess and mitigate risks across the defense industrial base that may impact our nuclear sustainment and modernization efforts—including with respect to large solid rocket motors, radiation hardened microelectronics, and aeroshells.

Nuclear Enterprise Review Follow-up

The 2014 Nuclear Enterprise Review (NER) identified a series of problems across the DoD nuclear enterprise and made hundreds of recommendations to correct them. As then-

Secretary of Defense Hagel stated upon conclusion of the NER in a November 14, 2014, *Message to the Force on Our Nuclear Enterprise*:

“Our nuclear deterrent plays a critical role in assuring U.S. national security, and it is DoD’s highest priority mission. No other capability we have is more important...For too long, we have overlooked career paths, compensation, infrastructure, and small unit leadership that are mission-critical in the nuclear force. That is changing. It will *continue* to change.”

DoD continues to carry this torch and continues to take action to ensure our nuclear enterprise stays healthy. For instance, the Nuclear Deterrent Enterprise Review Group (NDERG), created in 2014 to ensure effective follow-up on the NER’s recommendations, recently met and reviewed progress across the enterprise.

As we institutionalize the NDERG for the long-term, A&S is leading the NDERG in a transition from a mission that largely looks back to address and close recommendations from the 2014 NER to instead also look forward to identify and address problems early. While the NDERG has closed many of the recommendations from the 2014 NER, some of the remaining recommendations are enduring, which will require DoD to track their associated metrics indefinitely. The NDERG and its stakeholders are also in the process of developing leading indicators and data analysis tools to ensure risks, issues, and opportunities across the nuclear enterprise are understood and effectively communicated to senior leaders.

Conclusion

History has made clear that the U.S. nuclear deterrent is the foundation of U.S. national security and fundamental to international stability. The FY 2020 budget request for DoD’s modernization and sustainment programs reflect that importance. Any large collection of complex and integrated programs faces risks, and our nuclear recapitalization and sustainment efforts are no different. The dedicated professionals in A&S, the Services, and NNSA are actively managing these programs to reduce risk, accelerate schedules, and seek efficiencies wherever possible. We recognize that this is a 20-year nuclear modernization journey we are embarked upon—but perhaps the biggest driver of risk is that we started that journey 15 years too late. Delay is no longer an option. I encourage Congress to provide the full amount of the budget request for nuclear programs in both DoD and NNSA.

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