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THE HOUSE ARMED SERVICES COMMITTEE  
STRATEGIC FORCES SUBCOMMITTEE

STATEMENT  
OF  
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BEFORE THE  
SUBCOMMITTEE ON STRATEGIC FORCES  
OF THE  
HOUSE ARMED SERVICES COMMITTEE  
ON  
FY 2021 BUDGET REQUEST FOR NUCLEAR FORCES AND  
ATOMIC ENERGY DEFENSE ACTIVITIES

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## **Introduction**

Chairman Cooper, Ranking Member Turner, and distinguished Members of the subcommittee, thank you for this opportunity to discuss the sustainment and recapitalization of the sea-based leg of the triad. It is an honor to testify before you today representing the Navy's Strategic Systems Programs (SSP) and representing the contributions the Navy provides to our national and global security.

The Nation's nuclear triad of intercontinental ballistic missiles, heavy bombers, and ballistic missile submarines (SSBNs) equipped with submarine-launched ballistic missiles (SLBM) is essential to and the very foundation of our Nation's security and survival. The nuclear triad is the bedrock of our ability to deter aggression, to assure our allies and partners, to achieve U.S. objectives should deterrence fail, and to hedge against an uncertain future. The 2018 Nuclear Posture Review (NPR) acknowledged that, while we are actively working to modernize our forces, U.S. modernization efforts lag behind those of our adversaries. Great Power competition has returned, thus reinforcing the need to recapitalize each essential and complementary component of the triad.

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Nuclear modernization must be fully funded.

The Navy provides the most survivable leg of the triad with the interdependent OHIO-Class SSBNs and the Trident II (D5) Strategic Weapon System (SWS), comprising both flight and shipboard systems. SSBNs are responsible for approximately 70 percent of the Nation's operationally deployed nuclear warheads as defined under New START. The Chief of Naval Operations has made clear that the Navy's first acquisition priority is to recapitalize our strategic deterrent and to "support COLUMBIA's fleet introduction on time or earlier." Concurrent with this is the need to develop the next generation of Trident II D5 SWS that will ensure the credibility of the sea-based strategic deterrent for decades.

SSP's core mission comprises two fundamental lines of effort: the safety and security of our Nation's strategic assets entrusted to the Navy; and the design, development, production, and sustainment of the Navy's SWS. We strive to maintain a culture of excellence, underpinned by rigorous self-assessment, to achieve the highest standards of performance and integrity for personnel supporting the strategic deterrent mission. We focus unremittingly on our tremendous responsibility for the custody and accountability of our Nation's nuclear assets. The men and women of SSP, our Sailors, our Marines, our Navy Masters at Arms, our Coast Guardsmen, and our industry partners remain dedicated to supporting the strategic deterrence mission, to responding to the emerging needs of our warfighter, and to protecting and safeguarding our Nation's assets with which we are entrusted. Our Fiscal Year (FY) 2021 budget request provides the required funding to support the recapitalization of the SSP portion of the sea-based strategic deterrent. This funding includes: the SWS sustainment for the OHIO-Class SSBN and SWS procurement for the COLUMBIA-Class SSBN; the Trident II (D5) Submarine-Launched Ballistic Missile (SLBM) Life Extension sustainment and critical initial investment in the next generation Trident II (D5) SWS; continued support of existing warhead activities and required investment in NPR supplemental capabilities; industrial base and infrastructure needed to support modernization; and, most importantly, the people who execute the deterrence mission.

The men and women of SSP and their predecessors have provided unwavering and mission-focused support to develop, sustain, and secure the sea-based leg of the triad for nearly 65 years. However, SSP's critical modernization bow wave is no longer part of the future—it is today. We are heading down a path from which we cannot turn away. Our workforce must evolve from years of sustainment efforts to the dual responsibilities of sustainment and development. Our industrial base has eroded under years of sustainment with minimal focus on future technologies. Investment in critical workforce skills, the industrial base, and complex technologies unique to strategic systems is essential to the Navy's ability to sustain not only today's sea-based strategic deterrent but to respond to emerging warfighter needs with cost-effective, creative, and timely solutions through the life of the COLUMBIA-Class SSBN.

As the fourteenth Director, it is my highest honor to serve as the program manager, technical authority, safety and security lead, regulatory lead, and Polaris Sales Agreement Project Officer for the Navy's nuclear weapons program. Most importantly, I am honored to

represent the men and women of SSP, comprising approximately 1,500 Sailors, 1,000 Marines, 300 Coast Guardsmen, 1,300 civilians, and thousands of contractor personnel. It is my most critical goal to ensure they are poised to execute the mission with the same level of success, passion, and rigor both today *and* tomorrow as they have since our program's inception in 1955.

### **SWS Sustainment on OHIO-Class SSBN and Procurement for COLUMBIA-Class SSBN**

Today's fragile relationship between sustainment of legacy systems and their replacements remains omnipresent in the calculus of effectively deterring adversaries. The Navy's highest priority acquisition program is the COLUMBIA-Class Program, which replaces the existing OHIO-Class submarines and which must procure a minimum of 12 submarines. The OHIO-Class SSBNs begin decommissioning in the late 2020s, and the COLUMBIA-Class must be ready to begin patrols no later than FY 2031. Recapitalizing our SSBNs is a significant investment that only happens every other generation, making it critically important that we do it right and on time. *Delay is not an option.* The continued assurance of our sea-based strategic deterrent requires not only a next class of ballistic missile submarines, but equally critical, a credible SWS. The Navy is taking the necessary steps to ensure that the next generation deterrent is designed, built, delivered, and tested on time and provides flexibility and adaptability in the dynamic threat environment at an affordable cost.

A critical component of the COLUMBIA-Class Program is the development of a Common Missile Compartment (CMC) with the United Kingdom. Today, the U.S. Navy shares the Trident II (D5) SWS with the UK aboard its Vanguard-Class of ballistic missile submarines. Similar to the U.S. Navy, the UK is recapitalizing its four aging Vanguard-Class SSBNs with the Dreadnought-Class SSBN. The CMC will support today's Trident II (D5) SWS that will be deployed as the initial loadout on COLUMBIA and the UK Dreadnought-Class SSBNs. Our partnership also supports production of these two new classes of SSBNs in both U.S. and UK build yards. Ensuring that the COLUMBIA-Class program remains on schedule supports not only our Nation's operational requirements, but also the ability of the UK, our most important ally, to maintain its Continuous at-Sea Deterrent.

To lower development costs and leverage the proven reliability of the Trident II (D5) SWS, the COLUMBIA-Class SSBN will enter service with the life-extended Trident II (D5) SWS, which is resident on today's OHIO-Class submarines. Maintaining a common SWS during the transition between existing and successor submarine platforms allows the Navy to leverage a mature material and knowledge enterprise, thus reducing programmatic costs and risks. Life-extended missiles will be shared with both the OHIO- and COLUMBIA-Class submarines in the U.S. and with the UK Vanguard-Class and Dreadnought-Class submarines into the 2040s when a next generation SWS must be fielded.

Another major initiative to reduce risk associated with the overhaul of the sea-based strategic deterrent is the SSP Shipboard Systems Integration (SSI) Program, which manages obsolescence and modernizes SWS shipboard systems through the use of open architecture design and commercial off-the-shelf hardware and software wherever feasible. The SSI Program refreshes shipboard electronics hardware and upgrades software, 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 U.S. Strategic Command (USSTRATCOM) requirements. The in-progress incremental upgrades to the SWS shipboard systems resident on the OHIO-Class are also linchpins to the timely delivery of the COLUMBIA-Class SSBNs. Modernization of the SWS shipboard systems leverages engineering techniques and methodologies, such as Agile, and embraces model-based engineering design practices in order to effectively respond to today's dynamic environment. The Navy's strategy of addressing obsolescence while simultaneously providing warfighter capability highlights the complex dynamic of sustainment and modernization of our nuclear deterrent.

## **Trident II (D5) Life Extension and Life Extension 2**

The Trident II (D5) SWS capability has been deployed on the OHIO-Class ballistic missile submarines for nearly three decades and is planned to be deployed more than 50 years. This demand for service life from today's high-performing systems has resulted in a missile life extension effort to match the OHIO-Class submarine service life and, in concert with the SSI Program for shipboard systems, to serve as the initial SWS for the COLUMBIA-Class SSBN.

The D5 Life Extension (D5LE) will ensure an effective and credible SWS on both the OHIO-Class and COLUMBIA-Class SSBNs into the 2040s. Our initial life extension of missile and guidance flight hardware components was designed to meet the same form, fit, and function of the original system, maintain the deployed system as one homogeneous population, control costs, and sustain the demonstrated performance of the system. The Navy's D5 life extension program is executing on schedule to continue to meet deterrence requirements and will complete deployment by FY 2024.

Within the last year, the Navy continued to demonstrate the highly reliable performance of the SWS through a total of seven D5LE flight tests in support of Demonstration and Shakedown Operations (DASO) 29 and 30 and the Commander's Evaluation Test (CET) 2. A DASO flight test is executed following the refueling period of an SSBN and provides the opportunity both to certify the SSBN crew to employ the SWS and to certify that the SWS continues to meet requirements. In contrast, the CET program obtains and monitors reliability, accuracy, and performance data of the D5LE missile population in an operational environment. The events executed to date in 2020 have resulted in 178 successful flight tests—an exceptional record for any weapon system.

As the Navy carefully manages the approach to end of life of our OHIO-Class SSBNs, we must address the viability of the SWS throughout the life of the COLUMBIA-Class SSBNs. As the 2018 NPR concluded, threats continue to evolve, and the warfighter requires flexible and adaptable solutions to complex problems. The current D5LE missile population faces attrition through component aging and flight test requirements, and a next generation of D5—Life Extension 2 (D5LE2)—must be ready for strategic deployment no later than 2039 to ensure that an adequate inventory of SLBMs are available to seamlessly sustain USSTRATCOM requirements. D5LE2 is structured to maintain today's unmatched reliability and demonstrated performance, while unlocking untapped system potential to efficiently respond to emerging needs and to maintain a credible deterrent throughout the life of the COLUMBIA-Class.

SSP has begun technical maturation of the D5 system's most complex and foundational technologies, such as strategic-grade guidance instruments and radiation-hardened microelectronics. This expertise has atrophied in industry today and will require investment and

time to reinvigorate the industrial base to support the deterrence mission. SSP also initiated architecture analyses to evaluate potential solutions to address emerging threats, improve supportability, and improve flexibility to address an uncertain future. To maximize affordability, analysis has focused on determining the effective composition of redesign, remanufacture, and pull-through of the most highly reliable components. This effort will continue in earnest in FY 2021. Historical timelines and lessons learned in our smaller-scale first life extension effort indicate that the workforce development and technology maturation of obsolete and complex components must begin now to support delivery of this capability to the warfighter in 2039. Full support of D5LE2 today is vital to achieving a 2039 fielding and to embarking on a path that maintains an SLBM deterrent capability through the service life of the COLUMBIA-Class SSBN.

### **Warhead Activities and NPR Supplemental Capabilities**

The Navy also works in partnership with the Department of Energy's National Nuclear Security Administration (NNSA) to refurbish our existing reentry systems and to respond to any emergent USSTRATCOM requirements. The Trident II (D5) is capable of carrying two types of warhead families, the W76 and the W88. In 2019, NNSA completed the W76-1 Life Extension Program, marking the U.S. stockpile's first full-scale warhead refurbishment program. The W76-1 program was a tremendous effort that informs much of our understanding of the technical complexity, costs, and timelines for refurbishment programs, and I laud our NNSA partners for their support of the Navy's deterrent.

The W88 warhead continues to undergo its refurbishment program on a revised timeline based on capacitor component issues that did not meet reliability requirements. In coordination with the Navy and NNSA, the Nuclear Weapons Council (NWC) has approved an 18-month delay to First Production Unit, which is now scheduled for July 2021. I am confident that our teams will work together to manage the delay, as we have historically addressed refurbishment challenges with a mission-focused attitude and rigor. The Navy will prioritize meeting our warfighters' requirements and minimizing disruption to the operational fleet to ensure that the sea-based leg of the triad continues to fulfill its deterrence mission. However, this program

setback represents the pervasive and overwhelming risk carried within the nuclear enterprise as refurbishment programs face capacity, funding, and schedule challenges.

In response to the 2018 NPR guidance to modify a small number of existing warheads to provide a low-yield SLBM warhead option and close an identified deterrence gap, NNSA and the Navy converted a small quantity of refurbished W76 warheads to a low-yield option, the W76-2. The Navy has fielded this capability. The W76-2 strengthens deterrence and provides the United States a prompt, more survivable low-yield strategic weapon; supports our commitment to extended deterrence; and demonstrates to potential adversaries that there is no advantage to limited nuclear employment because the United States can credibly and decisively respond to any threat scenario.

The 2018 NPR also directed the Navy to investigate the feasibility of fielding the nuclear explosive package from the Air Force's W78 warhead replacement into a Navy reentry body. To address the needs of the Navy and the warfighter and to support the United Kingdom's warhead replacement analysis, the NWC directed the Navy and NNSA to broaden the study and assess the feasibility of a range of options. At the study's conclusion, the Department of Defense directed the Navy to pursue the development and fielding of an aeroshell program and to enter into Phase 1 of the joint DoD-DOE Nuclear Weapons Lifecycle Process for a warhead; this effort is collectively known as the W93/Mark 7. This effort will address evolving ballistic missile warhead modernization requirements; improve operational effectiveness for USSTRATCOM; and mitigate technical, operational, and programmatic risk in the sea-leg of the triad. FY 2021 initial investment supports the reinvigoration of critical, niche national skillsets and capabilities uniquely associated with harsh reentry environments, and, therefore, is applicable to both the Navy and Air Force future needs. Development of this system not only addresses known U.S. risks, it supports the UK's critical need to recapitalize its deterrent, which is essential to the North Atlantic Treaty Organization's overall defense posture. Under the auspices of the Polaris Sales Agreement and the Mutual Defense Agreement, the paths and tools are in place to ensure each nation's needs are met. The Navy will work in close coordination with the Department of Defense, NNSA, the NWC, and the Congress as this effort matures.



Finally, SSP will continue to support the Navy's FY 2021 Analysis of Alternatives (AoA) for the 2018 NPR-directed nuclear-armed Sea Launched Cruise Missile (SLCM-N). We have been directed to complete this AoA in time to inform the FY 2022 Presidential Budget Request. Following the near-term W76-2 effort to close identified deterrence gaps, the mid-term SLCM-N could provide a flexible non-strategic option to further strengthen deterrence.

## **Industrial Base and Infrastructure**

Our modernization needs cannot succeed without investing in the research and development (R&D), critical skills, and facilities needed to produce, sustain, and certify our nuclear systems. Ensuring robust defense and aerospace industrial base capabilities—such as radiation-hardened electronics, aeroshells, strategic inertial instruments, and solid rocket motors—remains an important priority in conjunction with R&D investment. SSP has placed particular emphasis on the solid rocket motor industry and its sub-tier suppliers and appreciates the support of the Congress to allow for the continuous production of these vital components. Equally essential to the nuclear deterrent is a national aeroshell production capability. The FY 2021 budget request reflects a reinvigoration of an aeroshell production capability that is executed by a small cadre of highly skilled experts in a niche industry. Aeroshell investment supports not only the Navy but will also be cost-effectively leveraged by the Air Force and United Kingdom in their independent reentry program endeavors. Finally, R&D investment is critical to today's nuclear modernization needs to ensure that we advance necessary technology ahead of design needs and to train our workforce during the early years of development.

From an infrastructure perspective, our Trident and contractor facilities must be upgraded to address aging and to process modernized systems. Facilities and their supporting infrastructure serve as the crux of our ability to equip our SSBNs with the SWS and to provide approximately 70 percent of the Nation's deployed nuclear warheads. Investment in proactive, planned maintenance and upgrades can prevent throughput constraints and can level workload and simultaneous age-out of our processing facilities. The Navy relies on a limited footprint to outfit our submarines, and maintaining and sustaining facilities is critical to meeting our flight testing and deployment requirements. Our Nation must prioritize and fund their upkeep and upgrades in order to provide an effective and flexible deterrent in the future.

As the Navy executes the modernization and replacement of the SSBN and associated SLBM leg of the nuclear triad, DoD and NNSA's infrastructure must be prepared to respond in tandem to the evolving needs of the Nation. Of most importance, we must have an effective, resilient, and responsive plutonium pit production capability with a capacity of 30 pits per year during 2026 and a minimum of 80 pits per year during 2030. This capability can address age-related risks, support planned refurbishments, as well as prepare for future uncertainty. Additionally, tritium, lithium, and uranium, among other strategic materials, are vital to ensuring the Navy can continue to meet its strategic deterrent requirements. The FY 2021 budget for NNSA makes major investments in its infrastructure and in its ability to produce these strategic materials.

## **Workforce**

History reminds us that the swift, successful creation and execution of the Fleet Ballistic Missile program in the 1950s was truly a result of national commitment, congressional support, and cadre of hand-selected scientists, engineers, and inspirational leaders. Though process will always underpin our efforts, our dedicated predecessors—civilians, military, and industry partners alike—responded to the national need with focused determination and drove this program with a vision. People are as fundamental to our nuclear deterrent as the SWS itself. Today, SSP and its industry partners are focused on inspiring, growing, and retaining a generation of workforce that did not live through the darkest days of the Cold War. Connecting a new workforce to this fundamental global security mission remains an important task shared among the entire nuclear enterprise. A capable, credible, and affordable strategic deterrent for our Nation for the next 60 years requires not only technical, policy, management, and financial acumen—it requires passion and a commitment to making this our life's work.

## **Conclusion**

SSP ensures a safe, secure, effective, flexible, and tailorable strategic deterrent, with a steadfast focus on the proper stewardship, custody, and accountability of the nuclear assets entrusted to the Navy. Sustaining and modernizing the sea-based strategic deterrent capability is a vital national security requirement. 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

partners and to 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. I thank the committee for the opportunity to speak with you about the sea-based leg of the triad and the vital role it plays in our national and global security.