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STATEMENT OF

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ON NAVAL DOMINANCE IN UNDERSEA WARFARE

BEFORE THE

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SEAPOWER AND PROJECTIONS FORCES

SUBCOMMITTEE

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Mr. Chairman, Ranking Member, and distinguished members, we thank you for the opportunity to testify before the Seapower and Projection Forces Subcommittee, representing the men and women of your Navy's Undersea Forces.

The Undersea Forces of today's United States Navy provide significant, unique capabilities to the Joint Force Commander. We are part of the larger fleet and force and we provide unique attributes to that force. We are committed to both maintain these capabilities and to find and exploit new capabilities that expand our influence and effectiveness, and enable an even more valuable contribution to the Joint Force.

Undersea Warfare's Future

Undersea warfare in the future, like today, will consist of military operations that originate from the undersea or are directed into the undersea. The Chief of Naval Operations' (CNO) top priority continues to be to maintain and modernize the undersea leg of the strategic deterrent triad, because it is fundamental to our survival as a nation. Ballistic missile submarines provide the security the United States needs to perform all other military operations around the globe. Beyond Strategic Deterrence, the dominance of our Undersea Forces in the unique undersea environment enable U.S. forces, manned or unmanned, to hold adversary surface ships and submarines at risk, collect intelligence, launch Tomahawk strikes, deploy special operations forces and conduct mine-hunting operations.

Undersea warfare is no longer just submarine warfare. We will employ a domain-centric system of systems approach to maintain superiority in the future, with submarines as a premier node in that system. This domain-centric focus requires careful collaboration between every node in the network, including Undersea Forces and seabed systems, surface ships, aircraft, space assets, communications systems, and headquarters facilities, but yields outstanding results and greatly improved efficiency, as evidenced by recent maritime operations and exercises around the globe. This collaboration enables a truly disaggregated warfighting approach, where the targeting information is supplied to one node, which then attacks that target with a weapon, and that

weapon, as another node in the network, is updated with information from another node before it ultimately achieves its desired effect.

Strengths of Stealth

The undersea environment provides our Undersea Forces with a unique advantage amongst our Joint Force peers: persistent, undetected, assured, far forward access, and the influence that access provides. By leveraging concealment, our Undersea Forces can deploy forward without being provocative and, without being detected, penetrate anti-access/area denial (A2/AD) perimeters and conduct operations. In peacetime, these operations might be nuclear deterrent patrols, precautionary or preparatory ship movements, intelligence collection and surveillance, or Special Forces support.

Should it be necessary, these forces can also attack at the time and place of our choosing to maximize the desired effect and minimize the risk to American lives. These attacks would likely include efforts specifically focused on "kicking down the door" - helping gain access for follow-on general purpose forces. Concealment enhances the probability of survivability of an independently operating Undersea Force with offensively-minded weapons batteries and payloads. Finally, stealth enables Undersea Forces to create ambiguity which sows disruption and uncertainty in adversary operations, further enhancing our Undersea Forces' advantage.

The demand from our operational commanders for this capability is strong and growing. The commander of Pacific Command, Admiral Harry Harris, testified before the Senate Armed Services Committee in February that "we have a shortage in submarines. My submarine requirement is not met in PACOM, and I'm just one of many [combatant commanders] that will tell you that. But that's our principal asymmetric advantage." As the threat from adversary advances in sensors and weapons (such as cruise missiles, anti-ship ballistic missiles and integrated air defense systems) grows, Undersea Forces will be increasingly asked to accomplish missions once conducted by forces that are now held at increased and potentially unacceptable risk by the improved range, precision, and lethality of advanced systems. This pressure will be

further amplified by the proliferation of these advanced systems to more adversaries, presenting increased risk to our operations in A2/AD environments and in more places around the world.

In addition, the importance of Undersea Forces in protecting the globalized industrial economies of the world is hard to overstate and is growing. The intercontinental telecommunications backbone of the world rides on the seabed, with undersea cables carrying over 95 percent of all traffic. Offshore oil and gas production are rapidly growing, and undersea pipeline infrastructure is proliferating to service fields in Asia, the Middle East, the Gulf of Mexico, off Brazil, Africa, and in the North Sea. Transportation infrastructure such as tunnels, piers, and bridge supports are accessible from the undersea and the expansion of shipping traffic and oil drilling into the Arctic as ice-cover shrinks will further highlight the importance of the undersea to the global economy.

Considering these factors, it is clear that the importance of the undersea domain will continue to grow, in both economic and military terms, for the foreseeable future.

The Future Undersea Force

Today's Undersea Forces utilize the advantages of Undersea Warfare: domain access; penetration of adversary defenses; timely exploitation of surprise, ambiguity and uncertainty; survivability; and undetected operations. With these advantages in mind and with the understanding that the world is changing faster than ever, it is important to consider the hardware used to maintain America's undersea advantage. First, the submarine will continue to be a tool to inject human decision making into any future operations – in peacetime or wartime. The Navy has worked hard to arrest the downward trajectory in overall Navy force structure. However, the submarine force structure will get worse before it gets better.

This decline is not the result of some recent decision; it is the consequence of budget decisions taken over not just years, but decades. Only two submarines were procured from 1991 to 1998, producing two undesirable results. First, the expertise for submarine construction was dismantled and has only recently begun to recover to full strength. Second, it will result in the loss of nearly a dozen SSNs in the force. Today's attack submarine force of 53 SSNs will drop

to 41 and the four guided missile submarines (SSGNs) will drop to zero. The total submarine force will drop from 71 to 51 ships -- a cut of 28 percent – before rebounding in the 2030s. Even more striking, the vertical strike payload volume provided by the Undersea Force will drop by well over half. This trough is borne of the submarine shipbuilding hiatus of the 1990s and the decade of one-a-year SSN construction that followed, and no realistic build plan could now prevent it.

The Navy is reexamining the requirement for the minimum number of submarines in the Force Structure Assessment. The current requirement is 48 fast attack submarines, but that was developed over a decade ago in a much different strategic landscape. As described in the Chief of Naval Operations' *A Design for Maintaining Maritime Superiority*, today's strategic environment is dramatically more globalized with accelerating change. Our competitors are pursuing advanced weapon systems at levels and at a pace of development not seen since the mid-1980s. We are returning to a time of major power competition between recognized states, not merely the insurgencies we have become accustomed to in the last 15 years.

Second, the future Undersea Force is more than a submarine operating on its own. The Submarine Force Commander's Intent outlines several elements, including "Grow Longer Arms", "Beat the Adversary's System", and "Get on the Same Page," which all describe using both manned and unmanned systems to expand the reach of today's undersea forces. Some examples of these unmanned systems include unmanned underwater vehicles (UUV), unmanned aerial vehicles (UAVs), Unmanned Surface Vehicles (USV), expanded range and improved capability torpedoes and missiles, and seabed networks. Thanks to the support of Congress, some of these systems, like REMUS 600, Blackwing, and XFC, are already fielded and in the fleet. We use these systems of systems to SENSE, DECIDE, and ACT.

The first thing we do is sense the environment. This has to be across domains. It must include the traditional acoustic sensing, but also electromagnetic sensing, and optical sensing. We must use the lessons we have learned over decades of mastering acoustics and apply them to other realms. Make no mistake; the price of admission to dominate the undersea environment will continue to be acoustic superiority and the ability to deliver kinetic effects at sea and to land. But, what can be done better to gain advantage? It could be downloading information from in-place systems, such as sensors embedded on the sea floor. It must include a robust ability to

sense the entire radiomagnetic spectrum, both electromagnetic and cyberspace; and be able to share that information with the Joint Force without compromising stealth.

In a world where undersea forces may be the only "sensor" inside the A2/AD threat envelope, undersea forces must be able to move data and information across domains. Undersea force capability must include using the sea floor, and the ability to relay information covertly to the first human interface, likely onboard a future submarine. Our submarines in the future must be a fully integrated element of the larger fleet and joint force, while retaining the ability to operate independently.

Once we have "sensed" the environment, we must then "decide" and "act" on the data and information available to the commanders. It's all about access with influence. We want to provide a continuum of options for leadership. We want to have the ability to create effects, with a range of menu options that the undersea gives us.

We are exploiting the advantages of the undersea domain with our ability to sense, decide, and act with a greater sphere of influence. We must also leverage the pace at which technology is improving. The Navy and industry can only benefit from developing and delivering new technologies to the fleet faster.

Shortfalls in Undersea Forward Presence

Undersea Forces will suffer degraded forward presence in the 2020s. As a way of maximizing the deployed presence of U.S. nuclear submarines, the Navy uses different rotational duty models for SSNs, SSGNs and Guam-based SSNs. Over the next 15 years, the forward presence of SSNs and SSGNs taken together will fall by over 40 percent. Roughly half of this reduction is due to the decline in the number of SSNs and half is due to the retirement of the SSGNs. One additional SSN has been moved to Guam to help mitigate this decline; additional increases in the number of SSNs in Guam, however, are constrained by the current infrastructure available, and the increased risks associated with concentrating too much of the force in one potentially vulnerable place.

Today, the SSN force is at 53 SSNs -- above the 48-SSN minimum requirement defined by the decade-old force structure analysis. The combatant commanders' robust demand for SSN forward presence greatly exceeds that which can be provided. This was made clear earlier this year during testimony from PACOM and EUCOM.

In 2006, Congress tasked the Navy to determine how it would provide the required SSN forward presence of a 48-SSN Navy with a force that would drop as low as 40 SSNs. In 2007, CNO Mullen testified about the tools available to him to reduce the impact of letting the SSN force dip below the required 48 level. The three tools he outlined were (1) reducing the time to build each VIRGINIA Class submarine to about 60 months; (2) extending the service lives of selected LOS ANGELES Class SSNs beyond 33 years as fuel and material condition allow; and (3) using deployments as long as seven months to increase deployed availability. Since the first of the Block II VIRGINIAs was delivered in 2008, we have made significant progress in reducing the construction time of our submarines. The submarine force continues to deliver VIRGINIA Class ahead of schedule, even with the significant changes introduced with Block III. LOS ANGELES Class fuel and material conditions are being carefully managed to take advantage of any possible life extensions that may be possible. Lengthened deployments above 7 months, as mentioned, are already in use when required.

The Undersea Forces have demonstrated the willingness to exploit creative operational concepts and basing schemes, and will continue to investigate potentially effective ways to improve the presence of our limited number of SSNs during the shortfall time period. It bears noting, however, that while most of the available measures discussed increase SSN forward peacetime presence, none of them increase the number of SSNs available to surge in the event of conflict. The only solution to inadequate surge capacity is building more SSNs.

An Update to the Navy's Integrated Strategy for Future Undersea Capability

In 2011, the Navy developed an integrated approach to providing as much of the necessary future undersea capability as would be possible within realistic constraints on force size, budgets, shipyard capacity, practical maintenance limits, and technical realism. This integrated approach

does not solve all of the capability and capacity shortfalls faced by the Navy, but it focuses attention on providing specific strategic effects while remaining closely in touch with acquisition realism. We are here today to provide an update to that plan and how we have adapted the plan to ensure success in the future.

The following are the key interlocking pieces that represent the backbone of the Navy's lean integrated undersea investment strategy:

(1) It is mandatory that we sustain our survivable sea-based nuclear deterrent with at least the same level of at-sea presence as today – this is priority number one and underpins all other facets of our strategy. As this requires a force no smaller than 10 operational SSBNs, the Navy has extended the life of the OHIO Class submarines by nearly 50 percent – a notable engineering feat. Nevertheless, the life of the ship can be extended no further, and we must procure the first OHIO Replacement SSBN in 2021 so we can achieve that first patrol in FY31. It also fixes the start dates of the later ships as necessary to stay at 10 SSBNs during the transition from OHIO to OHIO Replacement and to restore the inventory to 12 to retain 10 operationally available as OHIO Replacement submarines enter extended depot availabilities.

(2) All three submarine types go through large drops between 2025 to 2030 that are beyond fiscal and shipyard capacity to address. SSN procurement must be our second priority, as dictated by the SSN force structure trough coupled with this undersea strike capacity shortage between 2025 and 2030. Between 2025 and 2030, the SSN force drops to 41, all four SSGNs retire and the SSBN operational force drops from 14 to 10. That is a low of 51 total submarines as compared to today's 71. This decommissioned SSGN strike capacity, if it is to be retained without interruption, must be built into future SSNs. Beginning with the second Block V VIRGINIA Class submarine, all follow on ships will include a 4-missile tube Virginia Payload Module (VPM). Even with the incorporation of VPM, the loss in undersea strike capability will only partially be regained by 2044.

(3) As the SSN force gets smaller and as the importance of its unique forward access becomes clearer, additional payloads are likely to be needed and employed. The strategic impact of each SSN being able to carry a family of different capabilities without any discernible external difference in the ship is daunting to an adversary planner and therefore not only valuable to military capability but to deterrence value as well. It is not necessary to field all of these payloads immediately – but the submarine must be capable of supporting them in the future, thereby giving future joint force commanders critical flexibility. Additionally, new sensors and stealth advancements should continue our dominance over capable undersea adversaries. When possible, these advancements should be developed to be field-able by today's submarines, but should also be able to exploit the future large tube payload volume, thereby delivering this flexibility for maximum strategic and deterrent value.

(4) The smaller SSN force structure will require each SSN to cover more physical territory and a wider array of potential new undersea targets, and deliver the fleet and joint force an expanded set of capabilities that span the spectrum of military operations.
The Navy appreciates the work the Committee and the Congress have done to ensure we efficiently and effectively restart the production line for our heavyweight torpedoes, and also to ensure that the next generation of future torpedo capabilities will be developed in a timely and cost-effective manner. However, today's Undersea Forces have already started, and must continue, developing our capabilities in unmanned systems such as Unmanned Aerial Systems (UAS) and UUVs. Additionally, our submarines' kinetic reach must continue to expand, both in the traditional Anti-Surface and Anti-Submarine role our heavyweight torpedo has traditionally filled, and in the newer role of anti-ship cruise missiles. We will also continue to pursue leveraging existing technologies to provide unique asymmetric effects from the Undersea.

(5) Maintain our focus on the acoustic spectrum, but explore opportunities and challenges in emerging aspects of the environment. The U.S. submarine force has traditionally focused on the acoustic spectrum, from technology to tactics. The future undersea force must build on the advances of the Acoustic Superiority Program and maintain our momentum, but also must master emerging environments, such as electromagnetic maneuver warfare and cyberspace. A critical enabling technology that we must pursue in this area is Low Probability of Intercept

(LPI) and Low Probability of Detection (LPD) Communications. We must be able to grow and adapt to improve our ability to sense, decide, and act.

OHIO Replacement

Some important aspects of the OHIO Replacement Program deserve special emphasis.

First, the sea-based strategic deterrence provided today by OHIO and tomorrow by the OHIO Replacement is foundational to the country's survival. It is the most survivable leg of the nuclear deterrent triad which is the bedrock of our ability to deter warfare with major adversaries. This prevention of major war and deterrence of nuclear coercion is one of the most important roles that we can have in the military, and our SSBN force is the cornerstone of that deterrent as it will be responsible for approximately 70 percent of our operationally deployed nuclear warhead inventory under implementation of New START Treaty limits.

Second, we have been conducting uninterrupted strategic deterrent patrols for more than 50 years, amounting to more than 4,000 patrols. As long as our adversaries retain nuclear weapons, we plan on continuing those patrols. The OHIO class represents the best lessons learned from the 41 for Freedom—the Fleet Ballistic Missile submarines that preceded it—and the OHIO Replacement will likewise benefit from the lessons learned from OHIO and VIRGINIA. We have optimized our SSBN model and know how to do sea-based strategic deterrence reliably and cost-effectively. Fifty years will have passed between the first OHIO patrol and the first patrol by the OHIO Replacement. That is a strong demonstration of cost efficiency.

Third, the effectiveness of the SSBN in its mission is determined by its survivability, and its survivability is driven by its stealth. Stealth is an attribute that is largely built into an SSBN in construction. We will leverage new stealth technologies developed for the VIRGINIA Class submarine, such as the special hull coating, as well as the technologies specifically designed for OHIO Replacement to ensure the SSBN force is invisible to our adversaries.

Finally, we took risk in our ability to meet SSBN requirements during the decade of transition when we delayed the OHIO Replacement SSBN by two years. This moderate risk was clearly articulated and well understood – but to ensure an uninterrupted undersea strategic deterrent provided by 10 operational SSBNs, the program cannot withstand any additional delay.

Notwithstanding these considerations, we are acutely mindful of the costs of the OHIO Replacement Program, the burden these costs pose on the U.S. Navy's entire shipbuilding program, and the resultant impact on the Nation's shipbuilding industrial base. We are absolutely determined to work across the Navy, with industry, and with Congress to field the OHIO Replacement in the most affordable manner consistent with mission requirements. All aspects of the OHIO Replacement Program will continue to be thoroughly reviewed and aggressively challenged to responsibly drive down engineering, construction, and operations and support costs while maintaining a credible, survivable nuclear deterrent capability.

Implementing the Integrated Undersea Strategy: OHIO Replacement SSBN

In 2015, a number of significant benchmarks in the OHIO Replacement program's life-cycle were met. In August, the Joint Requirements Oversight Council validated OHIO Replacement's Capabilities Development Document. This document defines the authoritative, measurable and testable capabilities needed to perform the mission. The program also went through the Navy's Gate 4 Review Process in November. This review ensured the proper requirements are in place and established the program's technical baseline. Establishing the technical baseline early in the program's life-cycle promotes stable requirements and supports a high-level of design maturity at construction start. Controlling that technical baseline going forward is equally critical in ensuring program success and diminishing the potential for cost overruns in the future. The OHIO Replacement Program has instituted formal and rigorous change control in management of the program's technical baseline to ensure that the platform's requirements are maintained and controlled at the appropriate level.

In early January 2016, we released the request for proposal (RFP) for ship design to the prime contractor. This contract will produce the diagrams, drawings and information necessary to

design, build, test and operate a submarine, enabling the shipbuilders to start construction in 2021, an important step in the way ahead for the program. We expect award by the end of the year. Presently, the program is preparing for the Navy's Gate 5 review in July and its Milestone B approval in August.

Implementing the Integrated Undersea Strategy: VIRGINIA and VPM

The Navy continues to deliver VIRGINIA Class submarines on budget and ahead of schedule. VIRGINIA Class submarines support five of the six Navy core maritime capabilities: forward presence, power projection, deterrence, maritime security and sea control.

The last ship delivered, USS JOHN WARNER (SSN 785), which features a completely redesigned bow section as part of the Design for Affordability efforts (an approximate 20 percent design change), delivered more than two months early with the least number of deficiencies of any VIRGINIA Class submarine to date as measured by the U.S. Navy's independent Board of Inspection and Survey (INSURV). VIRGINIA Class submarines are surge ready within months of delivery and capable of conducting their full mission set ahead of schedule. These submarines are on track to go from construction start to a fleet-ready asset in about five and a half years. The Block IV contract for ten ships continues the co-production of the VIRGINIA class submarines between General Dynamics Electric Boat (GDEB) and Huntington Ingalls Industries - Newport News Shipbuilding (HII-NNS) through FY 2018. The savings realized with this Multi Year Procurement (MYP) contract were over $2 billion, effectively giving the Navy "ten ships for the price of nine."

In March 2016, the U.S. Navy provided an update on the Submarine Unified Build Strategy (SUBS) for concurrent OHIO Replacement and VIRGINIA Class submarine production using the guiding principles of affordability, delivering OHIO Replacement on time and within budget, maintaining VIRGINIA Class performance with a continuous reduction in costs, and maintaining two shipbuilders capable of delivering nuclear-powered submarines. General Dynamics Electric Boat will be the prime contractor and delivery yard for OHIO Replacement, with about 22 percent of the labor hours to take place at Huntington Ingalls Industries-Newport News

Shipbuilding. Both contractors will continue to deliver VIRGINIA Class submarines. We updated our modeled design-build processes to link the existing VIRGINIA Class submarine and OHIO Replacement program models, which include the design and engineering effort linked with construction. We believe this approach will yield significant savings.

With each VIRGINIA Class submarine we put to sea, the Navy, our shipbuilding partners General Dynamics Electric Boat and Huntington Ingalls Industries – Newport News Shipbuilding, and our over 4,000 suppliers in nearly all fifty states are gleaning valuable lessons learned that can and will be applied to our future designs. Our success is dependent on those that have come before us and who have performed the programmatic, engineering, and technical rigor and analysis that have made our Submarine Force without peer, and we must continue to build upon this achievement to enable our future successes. To that end, the OHIO Replacement and VIRGINIA Class Programs have developed a highly collaborative construct ensuring that every lesson learned and efficiency from the VIRGINIA Class program is applied to the OHIO Replacement. These submarines are a vital part of our Nation's current and future undersea strategy, providing the "on scene, but unseen" guarantee of safety and security to our Nation.

Summary

In closing, we would like to highlight three points:

1. The importance of the undersea is growing – both economically and militarily – and in the future we will need to place increasing emphasis on stealthy undersea forces, to include our sea-based strategic deterrent, which is foundational to our survival as a nation.

2. This increasing importance is painted against an undersea force structure baseline that will decline – as a result of a series of decisions made over many years -- by nearly 30 percent between now and 2030. The Navy is taking every action to address the shortfall in attack submarines that will occur in the late 2020s.

3. The Navy has in place and is executing an integrated undersea capability plan that makes the most of a declining submarine force structure by marrying it with a forward-leaning payload volume and undersea system family that will deliver strategic influence, deterrence and, if necessary, robust warfighting capability.

The United States is fortunate to have what is by any objective measure the finest undersea force in the world. We face significant challenges to maintaining our undersea dominance, but we understand the challenges and are executing a realistic and economically feasible plan to address them.

We would like to thank the Committee for the opportunity to be here today to speak with you on our Undersea Warfare programs and the vital role they play in our national security today and well into the coming decades. We are happy to answer any questions you may have. Thank you.