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THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES

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BEFORE THE

SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES OF THE

HOUSE ARMED SERVICES COMMITTEE ON

DEPARTMENT OF THE NAVY SEAPOWER AND PROJECTION FORCES CAPABILITIES

MAY 24, 2017

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Chairman Wittman, Ranking Member Courtney, and distinguished members of the subcommittee, thank you for the opportunity to appear before you today to address the Department of Navy's Seapower and Projection forces capabilities.

The global activities over the last year have made it clear that the security challenges from major power competition are intensifying at an increasingly rapid pace. The Navy and Marine Corps continue to support the Joint Force in defending the homeland and responding to the security challenges of Russia, China, North Korea, Iran and global counter-terrorism. In the Indo-Asia-Pacific, our carrier strike groups, amphibious ready groups, and destroyers provide presence, strengthen partnerships, patrol the South China Sea to maintain interoperability, and deter adversaries. In the Middle East, our carrier strike groups and strike fighter aircraft continue operations against the Islamic State of Iraq and Syria. In Afghanistan, the Marine Corps deployed to Helmand Province to train, advise and assist the Afghan National Army and Police. Just last month, two destroyers operating in the Mediterranean Sea enabled the United States to take swift action against chemical attacks in Syria with Tomahawk cruise missile strikes.

Over 2016, the Marine Corps executed over 210 operations, 20 amphibious operations, 160 Theater Security Cooperation events, and participated in 75 exercises, with units deployed to every Geographic Combatant Command. And in response to a request for the U.S. Agency for International Development to assist with U.S. Government disaster relief efforts after Hurricane Matthew made landfall in October 2016, a Special Purpose Marine Air Ground Task Force (MAGTF) self-deployed within 48 hours to provide much needed aid to the people of Haiti, followed by the 24th Marine Expeditionary Unit (MEU) shortly thereafter. Our Sailors and Marines deployed around the world continue to perform missions and operate forward – ready to respond to any challenge and being where it matters when it matters.

To remain competitive, it is imperative that we continuously adapt to the emerging security environment – and do so with a sense of urgency. This requires working closely with Congress to return budget stability and predictability to the Department, and address defense spending in a fiscally responsible manner. Together, we can ensure our military's capability, capacity and readiness can continue to deliver superior naval power for the United States around the world, both today and tomorrow.

The Fiscal Year 2018 President's Budget Request

The Fiscal Year (FY) 2018 President's Budget submission is governed by the defense priorities of the Secretary of Defense to improve warfighting readiness and program balance by addressing pressing programmatic shortfalls that have accrued from 15 years of wartime operational tempo, fiscal constraints and budget uncertainty. Improving readiness directly impacts the operational capacity of our current fleet by ensuring that our ships and aircraft are ready to deploy when needed. If a ship is de-certified due to lack of maintenance, it is one less asset that the Navy and Marine Corps can deploy. The Department thanks the subcommittee for your efforts in supporting the Administration's request for additional funding for our critical readiness shortfalls and increases in force structure procurement in the FY 2017 Consolidated Appropriations Act.

At the same time, investing in the modernization of our current platforms and weapons is necessary to restore the fleet to full health and ensure they have the advanced capabilities needed to address the dynamic current and future threats. The FY 2018 request continues key investments in advanced technologies and modernization of our current Seapower and Projection forces.

The Navy prioritized addressing the significant readiness debt and improving the wholeness of our current fleet over our ability to grow force structure in this budget. The FY 2018 President's budget sustains procurement of eight ships in FY 2018: two SSN 774 *Virginia* class attack submarines; two DDG 51 *Arleigh Burke* class destroyers; one Littoral Combat Ships (LCS); one *Ford* class aircraft carrier (CVN); one *John Lewis* class fleet oiler (T-AO); and one Towing, Salvage and Rescue ship (T-ATS). The Secretary of Defense has prioritized growing capacity and lethality for the FY 2019 President's Budget. The wholeness that the FY 2018 President's Budget delivers will accelerate key warfighting capabilities and maintain the operational effectiveness of our current force, while also building a bridge to growing the future force in FY 2019.

The Navy's 2016 Force Structure Assessment (FSA) was developed in an effort to determine the right balance of forces – ships currently under construction and future procurement – needed to address the evolving and increasingly complex threats naval forces are expected to counter. The FSA detailed a long-term requirement for 355 ships in the battle force, assuming the Navy continues to replace the ships we have today with ships of similar capability and employs them using similar concepts of operations. The FY 2019 President's

Budget will be informed by the pending National Security Strategy and the National Military Strategy and chart a course to building the larger, more capable battle force the nation needs.

In addition, the Department continues to analytically assess the Future Fleet Architecture studies directed by the FY 2016 National Defense Authorization Act in order to incorporate the most promising elements in our concept development, research and development, and rapid fielding efforts. This assessment will innovate ways to deliver the equivalent naval power of a larger force.

Consistent with the defense priorities, the FY 2018 President's Budget request for procurement of expeditionary warfare and naval aviation remains consistent with last year's force structure plans. In FY 2018, this includes three Ship-to-Shore Connectors and 84 total aircraft, including seven P-8A Poseidon, five E-2D Advanced Hawkeye, and two KC-130J Hercules.

Summary

The Department of the Navy's FY 2018 budget request strategically delivers the best balance to responsibly improve the wholeness of our current forces. With Congress' support, we look forward to the growth of our future forces to meet the evolving threats. In addition, the Department is aggressively pursuing efforts to accelerate acquisition processes and schedules and further drive affordability into our programs, in order to deliver capability to our warfighters faster and be as effective as possible within our resources. We greatly appreciate this subcommittee's strong and consistent support for your Sailors and Marines.

Programmatic details regarding Navy and Marine Corps capabilities are summarized in the following section.

U.S. NAVY AND MARINE CORPS SEAPOWER AND PROJECTION FORCES CAPABILITIES

Aircraft Carriers

The aircraft carrier is the centerpiece of the Navy's Carrier Strike Groups and central to Navy core capabilities of sea control, maritime security, and humanitarian assistance and disaster relief. *Nimitz* and *Ford* class carriers will be the premier forward deployed asset of choice for crisis response and early decisive striking power in major combat operations for the next half-century. The Department has established a steady state *Ford* class procurement plan designed to deliver each new ship in close alignment with the *Nimitz* class ship it replaces. CVN 78 will deliver this month and will provide unprecedented capability to our nation for the next half century.

By capitalizing on lessons learned from the lead ship, CVN 79 and 80 have achieved significant cost reductions. The USS *John F. Kennedy* (CVN 79) is 28 percent complete with launch planned in 2020 and delivery in the fall of 2024. The USS *Enterprise* (CVN 80) has begun construction planning and long lead time material procurement. Construction is scheduled to begin in spring of 2018.

The *Nimitz* class Refueling Complex Overhaul (RCOH) is key to both the maintenance and modernization of each carrier in support of the second half of its service life. This spring, USS *Abraham Lincoln* (CVN 72) will return to the Fleet for another 23 years after completing her mid-life recapitalization depot availability to accomplish refueling of the ship's reactors, modernization, and repair of ship systems and infrastructure. This fall, USS *George Washington* (CVN 73) will begin her mid-life recapitalization.

Submarines

Ballistic Missile Submarines, coupled with the TRIDENT II D-5 Strategic Weapons System, represent the most survivable leg of the Nation's strategic arsenal and provide the Nation's most assured nuclear response capability. The current SSBN and SSGNs' life cycles cannot be extended, and the *Columbia* Class Program is on track to start construction in FY 2021, deliver to pace retirement of our current ballistic missile submarines, and deploy for first patrol in FY 2031. The Navy released the Detail Design Request for Proposal for *Columbia* and plans to award the design contract in calendar year 2017. The FY 2018

President's Budget supports the funding required to achieve a target of 83 percent design completion at construction start in FY 2021. This budget request also funds Continuous Production of Missile Tubes which will improve manufacturing efficiencies and vendor learning, maintain critical production skills, and reduce costs by leveraging high-volume procurements.

In addition to the Department of the Navy's budget request, the continued support of Congress for Naval Reactors' Department of Energy funding is vital to the Navy mission and ensuring the safe, reliable, and enduring operations of the nuclear-powered fleet. The President's FY 2018 budget fully funds Naval Reactors' request for the *Columbia* class SSBN. Recapitalizing this capability is critical to the Navy's readiness, specifically by ensuring adherence to the tight refueling and defueling schedule of nuclear-powered aircraft carriers and submarines.

The *Virginia* class submarine program continues to deliver submarines that are operationally ready to deploy within budget. The Block IV contract for 10 ships continues the co-production of the *Virginia* class submarines through FY 2018. The Navy intends to build on these savings and capitalize on increased efficiency and decreased costs with a *Virginia* class Block V Multiyear Procurement (MYP) contract for 10 boats, planned for FY 2019. The Block V contract will bring to bear two new capabilities to the fleet with the introduction of the *Virginia* Payload Module (VPM) and Acoustic Superiority. The Navy is investing in VPM to mitigate the 60 percent reduction in undersea strike capacity when the SSGN boats retire in FY 2026-2028.

In 2014, the Navy led a comprehensive government-industry assessment of shipbuilder construction capabilities and capacities at General Dynamics Electric Boat (GDEB) and Huntington Ingalls Industries-Newport News Shipbuilding (HII-NNS) to formulate the Submarine Unified Build Strategy (SUBS) for concurrent *Columbia* and *Virginia* class submarine production. This build strategy's guiding principles are: affordability; delivering *Columbia* 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. In 2016, the Navy established the Integrated Enterprise Plan to further the SUBS effort and provide a framework for an integrated approach to support *Columbia*, *Virginia*, and CVN construction. This long term plan will guide the execution of these nuclear powered platforms to reduce cost and schedule risk.

Large Surface Combatants

The *Arleigh Burke* class (DDG 51) program remains one of the Navy's most successful shipbuilding programs with 64 ships delivered to the Fleet. The FY 2018 President's Budget request includes the FY 2018-2022 MYP for ten destroyers, maximizing affordability and stabilizing the industrial base. All ships in this MYP will incorporate Integrated Air and Missile Defense and provide additional Ballistic Missile Defense (BMD) capacity known as Flight III, which incorporates the Air and Missile Defense Radar (AMDR). AMDR meets the growing ballistic missile threat by improving radar sensitivity and enabling longer range detection of increasingly complex threats. The program demonstrated design maturity through its successful completion of several stages of developmental testing and its recent achievement for entry into the Production and Deployment phase.

This radar is planned for inclusion in FY 2017 via an Engineering Change Proposal to the Flight IIA configuration. This much needed capability is essential for future sea-based BMD and is expected to deliver to the fleet in the early FY 2020s.

The DDG 1000 *Zumwalt* class guided missile destroyer is an optimally crewed, multi-mission, surface combatant designed to provide long-range, precision, naval surface fire support to Marines conducting littoral maneuver and subsequent operations ashore. The DDG 1000 program accomplished several milestones in 2016 including the first phase of delivery, commissioning, and sailaway of USS *Zumwalt* to its homeport of San Diego. The ship has completed multiple at sea underway periods for follow on testing and has since commenced its Combat Systems Activation period in its homeport of San Diego. USS *Zumwalt* will deliver in the spring of 2018. The remaining two ships of the class, DDG 1001 and DDG 1002 are under construction and are 92 and 59 percent complete, respectively.

Small Surface Combatants

The 2016 FSA revalidated the warfighting requirement for a total of 52 small surface combatants. To date, nine LCS ships have delivered and 17 are in various stages of construction. Both LCS shipyards have upgraded their facilities and have a qualified work force and industry team in place for full serial production; delivering ships well below the congressionally mandated cost cap. The Department continues to refine the requirements and acquisition strategy for the Frigate. To allow adequate time to mature the design and thoroughly evaluate design alternatives, the FY 2018 President's Budget request defers the first

year of Frigate procurement to FY 2020 with the LCS program continuing in FY 2018 and FY 2019 to bridge to the Frigate. The Department plans to transition to Frigate in FY 2020 and intends to maximize competition in the shipbuilding industrial base.

The LCS Mission Modules program continues the development of the Surface Warfare (SUW), Mine Countermeasures (MCM), and Anti-Submarine Warfare (ASW) capabilities and delivering individual mission systems incrementally as they become available. The LCS with an embarked SUW Mission Package (MP) provides a robust and flexible combat capability to rapidly detect, track, and prosecute small-boat swarm threats. The Surface-to-Surface Missile Module with Longbow Hellfire is currently in testing with Initial Operational Capability (IOC) planned for FY 2018. Development and integration of the ASW MP Escort Mission Module (EMM) and Torpedo Defense Module are ongoing. The Department recently awarded an option to build the ASW EMM and is on track to fully integrate with LCS to support IOC with the ASW MP in FY 2019.

The MCM MP provides the capability to detect, classify, identify, and neutralize mines throughout the water column, from the beach zone to the sea floor. Several of the MCM MP systems performed well during MCM MP TECHEVAL. IOC for Airborne Laser Mine Detection System and Airborne Mine Neutralization System was achieved in November 2016. These systems are in production and are being delivered to the fleet today. After cancelling the Remote Minehunting System program in FY 2016 due to poor reliability during TECHEVAL and following the conclusion of the Independent Review Team recommendations, the Department designated the MCM Unmanned Surface Vehicle (USV) as the new tow platform for minehunting operations. The MCM USV is based on the USV already used in the Unmanned Influence Sweep System program and development began in March of 2017. IOC is planned for FY 2020.

Amphibious Ships

Amphibious ships operate forward to support allies, rapidly and decisively respond to crises, deter potential adversaries, and provide the Nation's best means of projecting sustainable power ashore. They also provide an excellent means for providing humanitarian assistance and disaster relief. The 2016 FSA validated the warfighting requirement for 38 amphibious ships, driven by: maintaining persistent forward presence, which enables both engagement and crisis response; and delivering the assault echelons of two Marine

Expeditionary Brigades (MEB) for joint forcible entry operations. The 38 ship requirement is comprised of 12 Amphibious Assault Ships (LHD/LHA) and a mixture of 26 Amphibious Transport Dock (LPD), Dock Landing Ship (LSD), and Amphibious Ship Replacement LX(R) Ships. The amphibious force structure is projected to grow to a total of 34 ships starting in FY 2021.

LX(R) is the replacement program for LSD 41 and LSD 49 classes. The LX(R) program focus during the remainder of this year will be on completing the contract design efforts. The LX(R) contract design is being performed by General Dynamics National Steel and Shipbuilding Company (GD-NASSCO) and HII, in support of the future Detail Design and Construction competitive acquisition. The lead LX(R) is planned to begin construction in FY 2022.

LHA 6 *America* class ships are flexible, multi-mission platforms with capabilities that span the range of military operations, from forward deployed crisis response to forcible entry operations. These ships will provide the modern replacements for the LHA 1 *Tarawa* class ships and the aging LHD 1 *Wasp* class ships. USS *America* (LHA 6) completed its Post Shakedown Availability in March 2016 and will subsequently complete further operational testing and training in preparation for its first deployment. USS *Tripoli* (LHA 7) construction is 70 percent complete and on schedule to deliver in 2018. LHA 8 will have a well deck to increase operational flexibility and a reduced island that increases flight deck space to enhance aviation capability. The Detail Design and Construction contract for LHA 8 is scheduled to award this summer and delivery is planned for FY 2024.

The *San Antonio* class (LPD 17) provides the ability to embark, transport control, insert, sustain, and extract elements of a MAGTF and supporting forces by helicopters, tilt rotor aircraft, landing craft, and amphibious vehicles. Two ships are under construction, *Portland* (LPD 27) and *Fort Lauderdale* (LPD 28), and are planned to deliver in October 2017 and August 2021 respectively. LPD 28's design and construction features will leverage many of the ongoing LX(R) design innovations and cost reduction initiatives that are necessary for the program to achieve affordability goals while maintaining the high level capabilities of the LPD 17 class. Congress added a 13th ship (LPD 29) in FY 2017 which will mitigate critical impacts to shipbuilding and combat systems industrial bases caused by the gap in ship construction between the start of construction for LPD 28 and the start of construction for LX(R).

Auxiliary Ships, Expeditionary, and Other Vessels

Support vessels such as the Expeditionary Sea Base (ESB), Expeditionary Transfer Dock (ESD) and the Expeditionary Fast Transport (EPF) provide additional flexibility to the Combatant Commanders. The USNS *Montford Point* (T-ESD 1) and USNS *John Glenn* (T-ESD 2) provide two core capabilities of vehicle and equipment transfer at-sea and interface with surface connectors to deliver vehicles and equipment ashore to complete arrival and assembly. The USNS *Lewis B. Puller* (T-ESB 3), the first Afloat Forward Staging Base variant of the ESD, was delivered in June 2015 and becomes operationally available this year. T-ESBs are flexible platforms capable of hosting multiple mission sets with airborne, surface, and subsurface assets. ESBs 4 and 5 are under construction, with deliveries scheduled for March 2018 and May 2019, respectively.

The EPF provides a high-speed, shallow-draft alternative to moving personnel and materiel within and between the operating areas, and to supporting security cooperation and engagement missions. EPF 8 was delivered in April 2017 and production continues on EPFs 9-11.

The Combat Logistic Force consists of T-AOE fast support ships, T-AKE auxiliary dry cargo ships, and T-AO fleet replenishment oilers. Combat Logistics Force ships fulfill the vital role of providing underway replenishment of fuel, food, repair parts, ammunition and equipment to forward deployed ships and embarked aircraft, to enable them to operate for extended periods of time at sea. The *Kaiser* class (T-AO 187) fleet replenishment oilers will be replaced with the *John Lewis* class fleet replenishment oilers, designated T-AO 205 class. The Detail Design and Construction contract was awarded in 2016 to GD-NASSCO for production of the first six ships of the class.

The Department has begun procurement of a combined Towing, Salvage, and Rescue (T-ATS) ship to replace the four T-ATF 166 class fleet tugs, which reach the end of their expected service lives starting in 2020, and the four T-ARS 50 class salvage ships, which reach the end of their expected service lives starting in 2025. The lead ship is planned for award in 2017 and the total ship quantity is planned to be eight ships.

Also in 2016, the Navy and Coast Guard established an Integrated Program Office to rebuild the Nation's heavy icebreaking capability. The Navy is supporting the Coast Guard's efforts to responsibly and affordably recapitalize the heavy polar icebreaker fleet. The Coast Guard intends to leverage existing designs and mature technologies to mitigate schedule and

cost risks using a strategy based on robust industry collaboration and competition. Based on this effort, the Coast Guard expects delivery of the first icebreaker as early as 2023.

Surface Ship Modernization

Modernization is a critical aspect of sustaining the current fleet with advanced capability. The Navy and industry are collaborating on innovative approaches to conducting Modernization of Cruisers and Dock Landing Ships. The FY 2018 President's Budget includes funding for the modernization of six destroyers to sustain combat effectiveness, ensure mission relevancy and achieve the full expected service lives of the AEGIS Fleet. The request also continues to execute and fully funds \$4 billion over the FYDP for "2-4-6" modernization of seven cruisers to ensure long-term capability and capacity for purpose-built Air Defense Commander platforms. The remaining four CGs, which have BMD capability, will receive modernization to their hull, mechanical and electrical systems to support their operation through their engineered service life.

In order to maintain 11 deployable LSDs in the active force until LX(R) delivers, the Department continues modernization of three LSDs to ensure 40 years of operational service life for each ship. The first LSD, USS *Tortuga* (LSD 46), was inducted into modernization in FY 2016 and is scheduled to begin her modernization availability in FY 2018. This plan mitigates presence shortfalls and supports 2.0 MEB Assault Echelon shipping requirements.

Autonomous Undersea Vehicles

Autonomous Undersea Vehicles (AUV) are a key component of the Navy's effort to expand undersea superiority. These unmanned vehicles operate independently from or in cooperation with manned vehicles, conducting maritime missions such as Intelligence, Surveillance and Reconnaissance (ISR), Seabed Warfare, and Deception.

The Orca Extra Large Unmanned Underwater Vehicle (XLUUV) is one of the larger class unmanned undersea vehicles that is being designed to launch from a pier or large surface ship and operate for weeks or months. It will have extended range and a reconfigurable, modular payload bay to support multiple payloads and a variety of missions to complement manned systems.

The Snakehead Large Displacement Unmanned Underwater Vehicle (LDUUV) is an unmanned undersea vehicle to offload "dull, dirty, dangerous" missions from manned

platforms and mitigate the submarine gap beginning in 2022. Snakehead LDUUV will be launched from a variety of platforms, including both surface ships and submarines. The initial craft's mission will be intelligence preparation of the operational environment with follow-on missions including ISR, acoustic surveillance, ASW, MCM, and offensive operations.

Combat Systems

The Department continues to field the most capable and lethal surface and submarine combat systems in the world. The AEGIS Combat System Baseline 9, fielded on cruisers and destroyers, offers unprecedented defense capabilities, including simultaneous air and ballistic missile defense on Destroyers and Air Defense Commander capability on cruisers. By the end of 2017, the Navy will have completed a total of twelve AEGIS Baseline 9 Combat Systems installations. Baseline 10 will bring the AMDR radar providing enhanced radar performance and expanding the Navy's ability to perform the Integrated Air and Missile Defense mission.

The Ship Self Defense System combat system supports a myriad of mission areas on all Carrier and large deck Amphibious Class Ships (six ship classes).

The Department continues to aggressively pursue affordable defensive systems that are employable from multiple platforms. Under the Surface Electronic Warfare Improvement Program (SEWIP), the Department is replacing aging analog electronic warfare defensive systems first fielded in the early 1970's with new, digital systems. SEWIP Block 1 and 2 systems have been approved for Full Rate Production and are currently being fielded across the fleet. The SEWIP Block 3 program has completed its Critical Design Review in 2017 and is currently on track to begin fielding in the 2019-2020 timeframe.

The Submarine community continues to successfully deliver improvements in Anti-Submarine Warfare utilizing a bi-annual spiral development model and leveraging commercial off-the-shelf (COTS) technologies via the Acoustic Rapid COTS Insertion (A-RCI) program. Developmental towed arrays with improved telemetry have been successfully fielded on deployed fast attack submarines and new contracts for TB-29X and TB-34X, with these new telemetries were awarded in FY 2016.

Naval Aviation

Airborne Early Warning Aircraft

The Navy continues its full support for E-2D. E-2D is the premier Navy's carrier-based Airborne Early Warning and Battle Management Command and Control (C2) system. The aircraft provides 'Theater Air and Missile Defense' and Naval Integrated Fire Control-Counter Air and is capable of synthesizing information from multiple onboard and off-board sensors, making complex tactical decisions and then disseminating actionable information to Joint Forces in a distributed, open-architecture environment.

Maritime Patrol Aircraft

The P-8A Poseidon recapitalizes the ASW, ASuW, and armed ISR capabilities from the aging P-3C Orion. The P-8A combines the proven reliability of the commercial 737 airframe with avionics that enable integration of modern sensors and robust military communications. The first P-8A operational deployment was completed in June 2014, with continuous deployments to both 7th Fleet and 6th Fleet underway. As of April 2017, seven of twelve fleet squadrons have completed transition and an eighth is underway. All squadrons are scheduled to complete transition by FY 2020. The P-8A program is meeting all cost, schedule and performance parameters; it has achieved and surpassed reliability standards for operational availability and delivered forward commanders unprecedented capability.

Fixed Wing Aircraft

Fielded throughout our active force, the KC-130J brings increased capability, performance and survivability, with lower operating and sustainment costs for the MAGTF. Forward deployed in support of ongoing operations since 2005, the KC-130J continues to deliver Marines, fuel and cargo whenever and wherever needed. In 2017, the KC-130J remains in high demand, providing tactical air-to-air refueling, assault support, close air support and Multi-sensor Imagery Reconnaissance capabilities in support of Special Purpose MAGTFs and deployed MEUs.

Unmanned Aviation

The Navy is committed to unmanned carrier aviation. Towards that end, we are embarking on efforts that will result in the development of an unmanned mission tanker to

extend the range and reach of the Carrier Air Wing (CVW) with a secondary ISR mission. As MQ-25 will significantly extend CVW mission effectiveness range and address the future CVW-tanker gap, it will also preserve strike fighter fatigue life expectancy rates and help mitigate an expected strike fighter shortfalls (mid-2020s). As the first carrier-based ‘Group 5’ Unmanned Aircraft Systems (UAS), MQ-25 will pioneer the integration of manned-unmanned operations, mature complex sea-based C4I technologies, and pave the way for future multi-mission UASs to keep pace with emerging threats.

The MQ-4C Triton is a key component of the Navy Maritime Patrol Reconnaissance Force. Its persistent sensor dwell, combined with networked sensors, will enable it to effectively meet ISR requirements in support of the Navy Maritime Strategy. Triton will start establishing five globally-distributed, persistent maritime ISR orbits beginning in FY 2018, as part of the Navy’s Maritime ISR and Targeting Transition Plan. MQ-4C Triton test vehicles have completed over 110 test flights as of April 2017, and will complete sensor and performance flight testing this fall in support of an early operational capability in the Pacific next year.

The Navy utilizes MQ-8 to provide rapid employment of sea-based ISR with a radius greater than 110 nautical miles around a LCS or Suitably Equipped Air Capable Ships. In April 2017, a Fire Scout test team, along with Sailors aboard the USS *Montgomery* (LCS-8), successfully conducted dynamic interface testing to verify the MQ-8C launch and recovery procedures and test interoperability between the unmanned helicopter and the ship. With these tests completed, Fire Scout will be ready to begin Initial Operational Test & Evaluation (IOT&E) in the fall of 2017.

Weapons

The Department continues to make significant strides in extending the fleet’s layered defense battle-space while also improving the capabilities of the individual ship defense layers in order to pace the increasing anti-ship missile threat. Standard Missile-6 (SM-6) provides theater and high value target area defense for the fleet and with integrated fire control, has more than doubled defensive battle-space. In April 2017, SM-6 Block I testing successfully completed live fire requirements and the program is on schedule to declare Full Operational Capability (FOC) by the end of this calendar year. SM-6 Block IA is an enhanced version of SM-6 Block I with guidance section hardware and software modifications for improved

capability against advanced threats. Delivery of both the SM-6 Block I and SM-6 Block IA continue to meet contractual delivery schedule requirements.

The Evolved Sea Sparrow Missile (ESSM) provides another layer to the Navy's defended battle-space. The ESSM Block 2 Milestone C decision is scheduled for July 2018 with IOC for AEGIS platforms scheduled for 2020 and Ship Self Defense System platforms IOC in the 2022-2023 timeframe.

The third inner layer of the fleet's layered defense is the Rolling Airframe Missile (RAM) Block 2 designed to pace the evolving anti-ship cruise missile threat and improve performance against complex stream raid engagement scenarios. In FY 2017, the RAM Block 2 Program continued to demonstrate outstanding performance through successful fleet and ship qualification firing events. The RAM Block 2 will proceed to a Full Rate Production Decision Review in FY 2018 upon completion of the final modeling and simulation runs.

The FY 2018 President's Budget includes funding to continue upgrades to the Standard Missile-2 (SM-2) inventory with active guidance. This investment provides an affordable, integrated fire control capable, area defense missile to counter stressing threats.

The Department has aligned its Cruise Missile Strategy along warfighter domains to pursue maximized lethality while minimizing overall costs to the taxpayer. The first tenet of our strategy is to sustain the highly successful, combat proven, Tomahawk cruise missile inventory through its anticipated service-life via a mid-life recertification program (first quarter of FY 2019 start). This recertification program will increase missile service-life by an additional 15 years (total of 30 years) and enable the Department to support Tomahawk in our active inventory through the mid-late 2040s. In concert with our recertification program we will integrate modernization and technological upgrades and address existing obsolescence issues. In addition, we are developing a Maritime Strike Tomahawk capability to deliver a long-range anti-surface warfare capability.

Second, the Department will field the Long Range Anti-Ship Missile (LRASM) as the air-launched Offensive Anti-Surface Warfare/Increment 1 (OASuW/Inc. 1) material solution to meet near to mid-term anti-surface warfare threats. LRASM is pioneering accelerated acquisition processes. We anticipate LRASM will meet all Joint Chiefs of Staff-approved warfighting requirements, deliver on-time, and cost within approximately one percent of its original program cost estimate.

Finally, the Department plans to develop follow-on next generation strike capabilities,

including an air-launched OASuW/Increment 2 weapon to address long-term ASuW threats and a surface and submarine launched Next Generation Land Attack Weapon (NGLAW). NGLAW will have both a long-range land strike and maritime ASuW capability that initially complements, and then replaces, the highly successful Tomahawk Weapon System. To the maximum extent possible, the Department will leverage common components and component technologies to reduce cost, shorten development timelines, and promote interoperability.

Expeditionary Warfare

Expeditionary Warfare

The whole principle of Expeditionary Warfare is to operate forward, to exploit the seas as maneuver space as a base for global power projection, and to be ready to maneuver to shore when so ordered. Our ability to deploy from the sea in austere environments at a time and place of our choosing gives us significant tactical, operational and strategic advantages over potential adversaries. That ability is provided through the combination of connectors that move the ground force from the sea base to the ashore objective and the organic capability of the ground force to maneuver and fight once ashore.

The Navy/Marine Corps team provides the Combatant Commanders and our Nation the options needed to engage with our partners, to deter our adversaries and, when needed, to fight and win. That capability is underpinned by our disciplined, well-trained and motivated Sailors and Marines equipped with the amphibious ships, aircraft and weapons in our arsenal. Unique to our expeditionary warfare capabilities is the ability to exploit the sea as maneuver space and conduct operations unencumbered by the need for diplomatic clearances. Tactically, the ability to project multiple elements of a landing force ashore via multiple entry points using both vertical and surface means gives us greater flexibility in maneuvering into positions of advantage over an adversary. That ability is provided through the combination of connectors to move the landing forces from the sea to objectives ashore and the organic capability of the landing force to maneuver and fight while ashore. Our service capstone concept, the Marine Corps Operating Concept, envisions a future Marine force fighting at and from the sea to gain and maintain sea control and enable freedom of maneuver within a Naval or Joint Task Force. Development of these unique capabilities is on-going and is planned for near-term delivery with Force 2025.

Connectors

Our expeditionary warfare doctrine requires surface and vertical lift capability to transport personnel, supplies and equipment from within the seabase and maneuver them to objectives ashore. Surface and aviation connectors with enhanced speed and range will provide future expeditionary force commanders greater flexibility to operate in contested environments. While the aviation component of our connector capability has seen significant modernization with the fielding of the MV-22 and continuation of the CH-53K program, our primary surface connectors, the Landing Craft Air-Cushion (LCAC) and the Landing Craft Utility (LCU) are reaching the end of their service lives and require modern replacements.

The FY 2018 President's Budget funds the new LCAC-100 class air cushioned vehicles. The Ship-to-Shore Connector program will replace the aging LCACs which have undergone service life extension programs (SLEP) and a post-SLEP sustainment program. Additionally, FY 2018 budget request includes the procurement of the first LCU-1700 class craft which will begin the recapitalization of the aging LCU 1610 class.

These platforms are essential in connecting the combat power and logistics sustainment the sea base provides, with the forces operating in the littorals and executing inland missions. The Department will continue to explore future connector options that will increase our ability to exploit the sea as maneuver space by increasing range, speed, and capacity.

Combat and Tactical Vehicles

Combat and tactical vehicle modernization programs account for a significant portion of Marine Corps ground modernization investment. The overarching combat and tactical vehicle investment priority is the modernization of Assault Amphibian capability with a combination of complementary systems and programs. The Amphibious Assault Vehicle (AAV) Survivability Upgrade (AAV SU) and the Amphibious Combat Vehicle (ACV) programs are the means to replace the legacy AAV and are both in Engineering and Manufacturing Development phase.

The AAV SU program will modernize four Assault Amphibian companies and requisite elements of the supporting establishment (466 of 964 AAVs). This quantity supports the phased modernization of this critical capability while sustaining sufficient capacity to meet a 2.0 MEB Assault Echelon lift through 2035. The program was certified

Milestone B in the spring of 2014, and ten prototypes are currently undergoing developmental test and operational assessment. Milestone C is planned for the fourth quarter of FY 2017 and IOC is planned for FY 2019. FOC is planned for FY 2023.

The ACV 1.1 program will modernize two Assault Amphibian companies and will provide additional required lift capacity in support of the assault echelon (204 vehicles). The program was certified Milestone B in the fall of 2015. Two vendors (BAE and SAIC) were selected to produce 16 prototypes each for further testing. The vendors are currently building prototypes for delivery to the government and have begun developmental test. Milestone C is planned for the third quarter of FY 2018, and IOC is planned for FY 2020. FOC is planned for FY 2022.

The ACV 1.2 program phase is an increment that will modernize four Assault Amphibian companies to provide the balance of required capacity in support of sustained operations ashore (490 vehicles) along with mission role variants for C2 and maintenance and recovery. IOC is planned for FY 2023 and FOC is planned for FY 2026.

The ACV 2.0 program phase is an increment that will replace AAV SU by 2035. We remain committed to evaluating ways to extend the amphibious task force's operational reach. We have identified a decision point in the mid-2020s that will allow us to assess technologies and materiel alternatives to enable extended reach without unacceptable trade-offs and unaffordable costs. Science and Technology lanes have been established to: (1) Enhance ACV to improve water speed/fuel economy; (2) Research future sleds/connectors to transport lower water speed platforms at higher speed; and (3) Develop and experiment with small unmanned amphibious vehicles and swarms with modular payloads. This mid-2020's decision point will set the conditions to begin a program to replace the Survivability Upgraded AAV.

The second highest priority for combat and tactical vehicle investment remains the replacement of the portion of the high mobility, multi-purpose, wheeled vehicle (HMMWV) fleet that is most at risk; those trucks that perform a combat function and are typically exposed to enemy fires. In partnership with the Army, the Marine Corps has sequenced the Joint Light Tactical Vehicle (JLTV) program to ensure affordability while in the first increment replacing about one third (5,500 vehicles) of the legacy HMMWV fleet with modern tactical trucks in conjunction with the fielding of ACV 1.1. The program was certified Milestone C in the summer of 2015. The Marine Corps total Approved Acquisition

Objective (AAO) for HMMWV is 17,500. The Marine Corps approach to HMMWV modernization is composed of three increments. Increment I AAO is 5,500 and is fully funded, with an IOC is planned for FY 2020 and FOC planned for FY 2022. Increment II AAO, if resourced, is 3,591, which will extend procurement into the early-2020s. This increment is focused on replacing M1151 Weapons carriers in the Reserves and Supporting Establishment. Also, it will replace the oldest of our remaining A2 variants (M1123/M1097A2). IOC is planned for FY 2023. Increment III of JLTV will replace remaining legacy HMMWVs and is the subject of future analysis because it involves HMMWVs for which there is no current JLTV variant (i.e. ambulances and HMMWVs which can be replaced by lighter class vehicles). This third increment will be required to fully replace the legacy portion of the Light Tactical Vehicle fleet in the mid to late 2020s.

Marine Air-Ground Task Forces

The focus of our ground modernization efforts continues to be our combat and tactical vehicle portfolio, along with the C2 systems needed to leverage the entire MAGTF once ashore.

Critical to the success ashore of the MAGTF is our ability to coordinate and synchronize our distributed C2 sensors and systems. Our modernization priorities in this area are the Ground/Air task Oriented radar (G/ATOR) and the Common Aviation Command and Control System (CAC2S) Increment I. These systems will provide modern, interoperable technologies to support real-time surveillance, detection and targeting and the common C2 suite to enable the effective employment of that and other sensors and C2 suites across the MAGTF.

The G/ATOR system is on schedule and budget and will soon support air defense, air surveillance, and counter-battery/target acquisition. G/ATOR Block 1 provides the MAGTF a state-of-the-art air defense/surveillance capability. It achieved Milestone C in 2014 and is currently in low rate initial production (LRIP). The first two Block 1 systems were received by the Marine Corps this spring, and are now undergoing testing. G/ATOR Block 2 provides the MAGTF a state-of-the-art counter-battery/target acquisition capability and is in the Engineering and Manufacturing Development phase of acquisition. Funding in this budget request supports the continued development of G/ATOR Block 2 transition to Gallium Nitride module technology, and procurement of three G/ATOR Block 2 systems. Both Block 1 & 2

Systems will reach FOC by 2024. A final evolution of G/ATOR, designed to support the Marine Corps' air traffic control mission, is also planned.

Phase I Limited Deployment Capability of the CAC2S program was achieved in the second quarter of FY 2012 and the initial fielding was complete during fourth quarter FY 2013. Phase 2 addresses the remaining Air Combat Element Battle Management and C2 requirements. Phase 2 achieved a successful Milestone C in FY 2015. IOT&E of the Phase 2 system occurred in the third quarter of FY 2016. Fielding begins the third quarter of FY 2017. The AAO is 50 systems.

Counter Unmanned Aircraft Systems (C-UAS)

The proliferation and technological progression of readily available UASs to threat state and non-state actors have advanced at an unprecedented pace. We anticipate this trend to continue. The reconnaissance and attack capabilities of even smaller UASs represent a growing concern to the Joint Force.

The Marine Corps is pursuing an aggressive plan that fields the most capable, available C-UAS solutions for the warfighter in the near term, while we simultaneously pursue advanced technologies to support an enduring C-UAS capability. The C-UAS lessons gained in today's fight are also directly informing our long-term C-UAS requirements and solutions.

In response to the urgent needs of our forward commanders, we are now fielding available C-UAS capabilities that can detect, track and then attack the threat operator's radio frequency link to their UASs – the Man-Portable Anti Drone System – Kit (MADS-K). The MADS-K is an integrated radar, electro-optical/infra-red optic, and radio frequency (RF) jammer. The Marine Corps has procured nine MADS-K and has taken receipt of the first six. We've also very recently begun deploying these systems.

The Marine Corps is pursuing the integration of a MADS-K onto an MRZR and M-ATV light tactical vehicles. Once successfully integrated, this will provide a capability to detect, track, ID and RF defeat UAVs at the short-halt. Additionally, the Marine Corps is exploring integrating MODI II as the defeat mechanism which provides a more robust capability that can be employed in a dismounted configuration.

Looking forward, the Marine Corps anticipates a "kinetic kill" C-UAS capability will be a necessity. As one potential 'kinetic kill' C-UAS alternative, the Joint Land Force is experimenting with laser weapon systems. This past August, we initiated the Directed Energy

Weapon Review Approval Process with the intent to gain approval to operate a laser, specifically a 2kW Compact Laser Weapon System (CLWS), in theatre.

While lethal lasers have yet to be employed within a ground operational environment, the opportunity to employ the CLWS within an active theater of operation provides an ideal circumstance to learn and better understand the capabilities and limitations of lethal lasers as ground based air defense weapon systems.

The Marine Corps, partnered with the Army's Program Directorate - Counter Rocket Artillery Missile, is pursuing high energy lasers for an operation evaluation in support of Combined Joint Task Force-Operation Inherent Resolve. We envision this initiative to be a "proof of concept" for laser technology and will help inform our C-UAS community of interest if laser weapon systems are a viable near-term solution.

Other Unmanned Aircraft

To meet the demand for persistent, multi-role ISR capability, the Navy and Marine Corps are building a balanced portfolio of manned and unmanned aircraft focused on missions in the maritime environment. The Small Tactical Unmanned Aircraft System RQ-21A Blackjack program is a UAS that provides full motion video, communications relay package and automatic identification systems. The air vehicle's payload bay allows for rapid deployment of signal intelligence payloads. The Marine Corps is actively pursuing technological developments for the RQ-21A system in an effort to provide the MAGTF with significantly improved capabilities. Initiatives include over-the-horizon communication and data relay ability to integrate the system into future networked digital environments; electronic warfare and cyber payloads to increase non-kinetic capabilities; and change detection radar and moving target indicators to assist warfighters in battlespace awareness and force application. RQ-21A entered LRIP in 2013, completed IOT&E in the second quarter of FY 2015, with Full Rate Production deliveries planned for the second quarter of FY 2018.

In this same light, the Marine Corps has entered into the process to complete its three tiered family of UAS with the Joint Requirements Oversight Council's approval of the MAGTF UAS Expeditionary (MUX) Initial Capabilities Document in October 2016. MUX is envisioned to be a multi-mission, long endurance, seabased platform that will enable the MAGTF to provide, complement, or expand a Joint Force or geographic commander's capabilities during the conduct of campaigns, joint forcible entry operations, and crisis

response. The MUX analysis of alternatives will be conducted in FY 2018 and IOC is projected in the mid-2020s depending on the technologies selected to fill the MUX gaps.

Other MAGTF Programs

Individual Marines are the foundation of the Marine Corps, the MAGTF and our expeditionary capability. In addition to the major programs described above, this budget supports the continued delivery of required warfighting capabilities to our individual Marines and our flexible MAGTF structure in a timely and affordable manner. The Marine Corps continues to invest in the weapons, individual protective equipment, tactical radios, training systems, and information technology necessary to ensure an effective and efficient fighting force and keep faith with our commitment to those individual Marines who shoulder the burden and privilege of being America's expeditionary force in readiness.

Conclusion

The Department of the Navy continues to instill affordability, stability, and capacity into the shipbuilding, aviation, and expeditionary programs. Continued congressional support of the Department's plans and budgets will help sustain a viable industrial base. This request begins to lay the ground work for growing warfighting capabilities in the FY 2019 President's Budget, as the Department also makes initial investments in a larger Navy and Marine Corps. We thank you for your continued support of the Navy and Marine Corps and request your support of the FY 2018 President's Budget.