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THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES

STATEMENT

OF

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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

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Chairman Forbes, 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 Fiscal Year (FY) 2017 President's Budget submission is governed by the 2014 Quadrennial Defense Review (QDR), which implements the 2012 Defense Strategic Guidance (DSG) and continues our efforts to ensure our ability to protect the homeland, build security globally, project power and win decisively. As described in the Chief of Naval Operations' *A Design for Maintaining Maritime Superiority* and the Commandant of the U.S. Marine Corps' *Advance to Contact*, today's strategic environment is dramatically more globalized with accelerating change. Global connections continue to multiply, fueled by rapid advances and proliferation in technology, particularly information technology. Our competitors are pursuing advanced weapon systems at levels and a pace of development that we have not seen since the mid-1980s. It is imperative that we fund a force that can fight and win against any of our five major challenges (Russia, China, Iran, North Korea and Global Counter-Terrorism), investing in advanced capabilities that increase our lethality, for both the current and future force. This budget addresses that imperative by making investments to sustain our ability to fight with decisive capability over the full range of operations – at sea, from the sea, and across all domains.

Though budget issues have challenged the Department, our Sailors and Marines deployed around the world continue to perform the mission and operate forward, being where it matters when it matters. During a ten month deployment ending in June 2015, the *Carl Vinson* Strike Group and Carrier Strike Group (CSG) ONE conducted 12,300 sorties, including 2,383 combat missions against Islamic State of Iraq and Syria (ISIS). The USS *Theodore Roosevelt* (CVN 71) with CSG TWELVE returned from deployment in November 2015 after conducting over 1,800 combat sorties in Iraq and Syria against ISIS targets. During deployment, CVN 71 quickly relocated from the Northern Arabian Gulf to the coast of Yemen to respond to the Houthi insurgency, keep shipping lanes in the region safe and open, and intercept weapons shipments meant for the Houthi rebels. Day and night carrier-based airstrikes continue from the USS *Harry S. Truman* (CVN 75) which arrived in the Persian Gulf in December 2015 to support Operation Inherent Resolve.

The US 7th Fleet along with allies and partner nations combined for over 110 exercises throughout 2015 to train, build partner capability and relationships, and exchange information.

The largest exercise, Talisman Sabre in the Indo-Asia-Pacific region, in July 2015, featured 21 ships, including U.S. Navy aircraft carrier USS *George Washington* (CVN 73) and more than 200 aircraft and three submarines. This exercise continued to emphasis our Navy's worldwide presence and honed the skills to plan and execute contingency responses, from combat missions to humanitarian assistance efforts. The USS *Lassen* (DDG 82) continued to further U.S. presence and promote maritime security worldwide through participation in multilateral exercises with the Republic of Korea, France and Turkey, and patrols in the South China Sea. Additionally, the USS *Fort Worth* (LCS 3) conducted Code for Unplanned Encounters at Sea (CUES) exercises with the Chinese People's Liberation Army-Navy and completed the Cooperation Afloat Readiness and Training with our Indonesian allies to enhance interoperability and address shared maritime security priorities.

Our Naval forces in the 5th and 6th Fleet Areas of Operations (AOR) conducted a variety of missions in support of mine-countermine operations, Ballistic Missile Defense, counter terrorism and maritime security throughout 2015. In the 5th Fleet AOR, Commander Task Force (CTF) 52, consisting of US and United Kingdom units, successfully completed Mine Countermeasure Exercises (MCMEX) in November 2015. 6th Fleet's the USS *Cook* conducted ballistic missile defense exercises and participated in NATO's counter terrorism operation Active Endeavor in July and August 2015 in the Mediterranean and Black Seas. Additionally, USS *Ross* participated in a passing exercise (PASSEX) with Romanian, Turkish and Ukranian navies to strengthen partnerships with allies advancing security and stability in the Black Sea region. Furthermore, Naval Special Operations Forces (NAVSOF) continue operations in the Middle East, the Horn of Africa, and Central Asia. More specifically, NAVSOF is manning the Combined Joint Special Operations Task Force-Iraq and deploying forces to Afghanistan. Their operational tempo remains high.

The Marine Corps executed over 100 operations, 20 amphibious operations, 140 Theater Security Cooperation (TSC) events, and participated in 160 exercises during calendar year 2015. Marine Corps units deployed to every Geographic Combatant Command (GCC) and executed numerous TSC exercises to help strengthen relationships with allies and build partner capacity. Marines from Special Purpose Marine Air Ground Task Force – Crisis Response (SPMAGTF – CR) – Central Command and Advise and Assist teams advised and enabled the Iraqi Army. SPMAGTF-CR-Africa incident response force maintained various alert postures from Naval Air Station Sigonella, Italy, Naval Station Souda Bay, Greece, and Moron Air Base, Spain during

multiple iterations of Special Operations Command Africa operations, and provided fixed site security forces to US Embassy Bangui, Central African Republic, to assist in the reopening of the embassy.

Marine Expeditionary Units (MEU) provided support to the U.S. Embassy Sana'a, Yemen to safeguard American civilians and facilities including facilitating the evacuation of the Embassy in February and March. The 31st MEU also deployed to Saipan to provide Defense Support to Civil Authorities as Typhoon Soudelor passed through the Commonwealth of the Northern Marianas killing 30 and displacing 150,000 people. Marine Security Augmentation Units (MSAU) teams deployed 33 times in 2015 at the request of the State Department executing 12 Embassy/Consulate security missions and 21 VIP security missions. Additionally, Joint Task Force-505 (JTF-505) was activated in April 2015, under USMC operational command, in response to a large earthquake in Nepal which killed over 8,000 people and injured more than 21,000. JTF-505 Forward assumed command of all Department of Defense assets in support of Foreign Disaster Relief operations in Nepal and delivered about 114 tons of emergency relief supplies, transported 534 personnel and conducted 63 casualty evacuations.

Our Nation's away team, the Navy and Marine Corps, continues to stand the watch with an operational tempo that keeps nearly half of our Fleet underway every day. We must continually adapt to the emerging security environment to ensure our military's reach, presence, capability, and resolve to maintain this pace of operations remains superior in today's and tomorrow's world.

The Fiscal Year 2017 President's Budget Request

Our ability to respond to the dynamic strategic environment, high operational tempo and Combatant Commander requirements is constrained by the current fiscal realities. The Department is still recovering from funding shortfalls over FY 2013-2016 that collectively provided $30 billion less than the levels requested in our President's Budget submissions. The Bipartisan Budget Act of 2015 (BBA) provided critical relief from a return to sequestration levels in FY 2016 and FY 2017, but even with overseas contingency operations funding, the Navy's FY 2017 request is 3.9 percent less than the FY 2017 funding level requested in the FY 2016 President's Budget.

This fiscal context drives tough choices, but also inspires new thinking in order to best balance between capability, capacity, readiness and the vital industrial base. The FY 2017

President’s Budget integrates the mission guidance, operational context, and fiscal constraints in making focused investments, hard prioritized choices, and innovative reform to resource and deliver a global sea-based force. The Department’s shipbuilding, aviation and ground vehicle plans are formulated to provide the required force structure with the right capabilities, while preserving alternatives regarding the future force and the industrial base required to support it.

The Navy's current battle force objective of 308 ships is set by the FY 2014 update to the 2012 Force Structure Assessment (FSA). The FSA defines the balanced naval force, by type and quantity of ships, required to meet the full range of global naval operations that span from peace time presence to major combat operations.

The Navy's long range plan to reach and maintain the requirements of the FSA is outlined in the "30 Year Shipbuilding" report submitted to Congress each year. The fundamental principles bridging the long range shipbuilding plan and the 308-ship Navy defined by the FSA are that:

(i) the Navy's force structure, today and for the future, underpins our ability to provide for our national security;

(ii) a balanced mix of ships is necessary in order to conduct the wide range of operations required of the Fleet in the most effective, affordable manner possible;

(iii) the duration required to construct complex naval warships combined with the rate at which we procure these ships, requires the Navy to plan decades in advance to affect the size and capabilities of the force; and

(iv) stable, predictable ship construction at a sufficient rate is critical to Industry to enable it to make the capital investments and retain the critically skilled workforce required to build our Fleet, and critical to the Navy to enable us to procure our Fleet in the most effective, affordable manner possible.

With the strong support of Congress and close adherence to the long range shipbuilding plan over the period 2009-2016, the Navy is certain to reach a Battle Force of 308-ships in 2021 (the nominal year in which those ships procured by FY 2016 will have been delivered to the Navy). This twelve year span required to go from a Navy of 278 ships in 2009 to 308 ships in 2021, exemplifies the importance of the principles outlined above and, accordingly, why shipbuilding must remain a top priority for the Department of the Navy if we are to continue to provide the measure of maritime security and power projection required of our naval forces in the decades ahead. The FY 2017 President's Budget and the corresponding FY 2017 to FY 2021

Future Years Defense Plan (FYDP) establish the shipbuilding trajectory that will shape our Battle Force and its underpinning industrial base in the years following FY 2021.

The FY 2017 President's Budget request includes seven ships in FY 2017: two SSN 774 *Virginia* class attack submarines, two DDG 51 *Arleigh Burke* class destroyers, two Littoral Combat Ships (LCS), and one LHA 8 amphibious assault ship. In total, across the FY 2017 FYDP, this budget maintains most of the elements of our planned ship procurements in support of the FSA. However, in view of the Navy's projection that it will meet its force structure requirements in 2021 and in light of a separate capabilities based risk assessment by the Department of Defense, within the constraints of a budget impacted by the BBA, it was determined that a shift from shipbuilding investment towards investment in modernization and advanced capabilities would provide the best overall balance of capability and capacity to meet the needs of the current and future fleet. This decision results in an overall reduction to 38 ships in the FY 2017 FYDP, most notably impacting our small surface combatants.

Naval Aviation

Naval Aviation provides our Nation's leaders with responsive, scalable, and decisive means to maintain maritime security, project power ashore, deter and, when necessary, defeat our adversaries. The Navy/Marine Corps 'Vision for Naval Aviation 2025' provides the framework for determining investment priorities across the triad of warfighting capability, capacity, and aviation wholeness.

Specifically, the FY 2017 President’s Budget (as it affects the Seapower and Expeditionary Forces portfolio): enables Naval Aviation to continue recapitalization of our aging fleets of early warning and maritime patrol platforms with the E-2D and P-8A aircraft and continues investments in unmanned aircraft systems for persistent, multi-role intelligence, surveillance, and reconnaissance (ISR) capabilities with the Carrier-based RAQ-25, Unmanned Aircraft System (UAS), the MQ-4C Triton, the MQ-8 Fire Scout, the RQ-21 Blackjack and the RQ-7B Shadow. Additionally, this budget fully implements the Department’s Cruise Missile strategy with investments in Tactical Tomahawk production, mid-life recertification and modernization efforts; fielding of the Long Range Anti-Ship Missile (LRASM) as the Offensive Anti-Surface Warfare (OASuW) Increment 1 material solution; and development of follow-on Next Generation Strike Capability (NGSC) weapons (OASuW Increment 2 and Next Generation Land Attack Weapon (NGLAW)) to address the future threats.

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.

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 necessary, to fight and win. In the 36th Commandant's planning guidance, he emphasized the "inherent flexibility, scalability, and combined arms capability" of the Marine Air Ground Task Force (MAGTF). At its core, the capability - the strength - of the MAGTF is that of our Sailors and Marines; well-disciplined, well trained, and well-equipped with the amphibious ships, aircraft, armored vehicles, and weapon systems of our combined naval force. Unique to our expeditionary warfare capabilities is the ability to maneuver ashore and force entry once there. 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 FY 2017 President's Budget provides for the Ship to Shore Connector (SSC) across the FYDP as well as the portfolio of ground combat and tactical vehicles (GCTV), and the Command and Control (C2) systems needed to leverage the entire MAGTF once ashore.

Summary

Safely, reliably, certainly, your Navy and Marine Corps are stationed around the globe; maintaining their readiness, sustaining their high operational tempo, and conducting naval missions spanning from peacetime presence to war in response to the demands of their Combatant Commanders and the needs of the Nation. The Department of the Navy's FY 2017 budget provides the warfighting capabilities - ships, aircraft, amphibious and armored vehicles, combat and C4I systems, and weapons - required by our Sailors and Marines in the performance of their mission against the increasingly complex threats that challenge our security and that of our partners and allies around the globe today.

Reductions to the Department's FY 2017 top line due to the Bipartisan Budget Act of 2015 and the Budget Control Act of 2011, however, have forced revisions to the shipbuilding,

aviation, and Marine Corps programs that we presented to the Congress with the FY 2016 budget. We have been aggressive in our efforts to drive down the cost of our weapon systems in order to offset this top line reduction to the extent possible. Ultimately, however, we have been required to make cuts to programs that we presented as warfighting requirements just one year ago. We have been judicious in these decisions and are prepared to provide the Committee the basis and impact to operational requirements, cost, and the industrial base associated with each of these decisions. Programmatic details regarding Navy and Marine Corps capabilities and the Department of the Navy FY 2017 budget request are summarized in the following section.

Congress' strong support for the Department of the Navy's FY 2016 budget is a great testament of your support for our Sailors and Marines and their mission. We look forward to continuing to work closely with you and hope to build upon such past strong support as you evaluate this FY 2017 budget request and carry out your responsibilities to "provide and maintain a Navy."

US 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. Our aircraft carriers' ability to provide forward presence; to rapidly and decisively respond to global crises; to simultaneously deter potential adversaries and assure allies; and to project power at sea and ashore make these national assets the first instruments of our Nation's will and the definitive symbol of our Nation's defense strategy.

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. The *Ford* class design improves warfighting capability, survivability, operational availability, and quality of life for Sailors, while reducing total billets, including ship's crew and airwing, by nearly 1,200 personnel and decreasing total ownership costs by approximately $4 billion per ship.

The Navy is committed to delivering the lead ship of the class, *Gerald R Ford* (CVN 78) within the $12.887 billion congressional cost cap. Sustained efforts to identify cost reductions and drive improved cost and schedule performance on this first-of-class aircraft carrier have resulted in highly stable cost performance since 2011. Based on lessons learned on CVN 78, the approach to carrier construction has undergone an extensive affordability review and the Navy and the shipbuilder have made significant changes on CVN 79 to reduce the cost to build the ship. The benefits of these changes in build strategy and resolution of first-of-class impacts experienced on CVN 78 are evident in early production labor metrics on CVN 79. These efforts are ongoing and additional process improvements continue to be identified.

Alongside the Navy's efforts to reduce the cost to build CVN 79, the FY 2016 National Defense Authorization Act reduced the cost cap for follow ships in the CVN 78 class from $11,498 million to $11,398 million. To this end, the Navy has further emphasized stability in requirements, design, schedule, and budget, in order to drive further improvement to CVN 79 cost. The FY 2017 President's Budget requests funding for the most efficient build strategy for

this ship and we look for Congress' full support of this request to enable CVN 79 procurement at the lowest possible cost.

USS *Gerald R Ford* (CVN 78) is in the final stages of lead ship completion. As of January 2016, CVN 78 is 96 percent complete. 80 percent of the Hull, Mechanical, and Electrical Testing (HM&E) and 63 percent of Electronics testing is complete. CVN 78 is scheduled to begin Sea Trials in June 2016 and deliver in late August/early September 2016. Post Delivery Post Shakedown Availability (PSA) is planned for 2017 and the first of class Full Ship Shock Trials are planned for FY 2019. CVN 78's first deployment is planned for FY 2021.

The Navy awarded the CVN 79 fixed price construction contract in June 2015 and as of January 2016 the ship is 16 percent complete. The keel was laid in July and launch is planned for 2020. The Navy will deliver the CVN 79 within the cost cap using a two-phased strategy wherein select ship systems and compartments that are more efficiently completed at a later stage of construction - to avoid obsolescence or to leverage competition or the use of experienced installation teams - will be scheduled for completion in the ship's second phase of production and test. *Enterprise* (CVN 80) began construction planning and long lead time material procurement in January 2016 and construction is scheduled to begin in 2018. The FY 2017 President's Budget request re-phases CVN 80 funding to support a more efficient production profile, critical to performance, below the cost cap. CVN 80 planning and construction will continue to leverage class lessons learned to achieve cost and risk reduction, including efforts to accelerate production work to earlier phases of construction, where work is more cost efficient.

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. USS *Abraham Lincoln* (CVN 72) is scheduled to complete steam plant testing in Spring 2016 and is scheduled to complete RCOH and return to the Fleet in November 2016. USS *George Washington* (CVN 73) executed her homeport shift to Norfolk, Virginia in December 2015 for a scheduled RCOH start in August 2017. CVN 73 advanced planning activity and long lead time material procurement initiated in February 2015.

Submarines

Submarines' stealth and ability to conduct sustained forward-deployed operations in anti-access/area-denial environments serve as force multipliers by providing high-quality

Intelligence, Surveillance, and Reconnaissance (ISR) as well as indication and warning of potential hostile action. In addition, attack submarines are effective in anti-surface warfare (ASuW), undersea warfare and the insertion of Special Operating Forces (SOF) in almost every environment, thus eliminating any safe-haven that an adversary might pursue with access-denial systems. As such, they represent a significant conventional deterrent. The Navy is mitigating an impending attack submarine force structure shortfall that commences in the mid-2020s through multiple parallel efforts: continuing procurement of two SSN 774 *Virginia* class submarines per year; reducing the construction span of *Virginia* class submarines; and extending the service lives of select attack submarines (SSN 688s) with the potential to reduce the SSN shortfall of 51 ship years. While each of the Navy's attack submarines provides considerable strike capacity, guided missile submarines (SSGN) provide substantially more strike capacity and a much more robust capability to deploy SOF personnel. Lastly, the Navy's 14 ballistic missile submarines (SSBNs) provide the Nation with an around-the-clock, credible, modern and survivable sea-based strategic deterrent.

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. Originally designed for a 30-year service life, the *Ohio* class was extended to its current limit of 42 years of operation. As the current SSBN and SSGNs' life cycles cannot be extended further, the U.S. continued development of the follow-on twelve ship OHIO Replacement (OR) SSBN program for a lead ship delivery in 2028 is vital. This is our top priority program within the Department of the Navy.

The OR program achieved significant progress in 2015 as the program's Capability Development Document (CDD) was validated by the Joint Requirements Oversight Council (JROC) in August and the program Technical Baseline was locked in November with a robust plan for requirements control and cost containment. In January 2016, the Navy released the Detail Design Request for Proposal for the OR program to the prime contractor, General Dynamics Electric Boat (GDEB), and anticipates awarding the contract by the end of 2016. The contract effort will produce the diagrams, drawings and information necessary to design, build, test and operate this class of submarines, enabling the shipbuilder to formally start construction in 2021. The program is on track to mature technologies to meet requirements defined in the CDD and proceed to detail design in the Engineering and Manufacturing Development (EMD) Phase after the Milestone B decision in summer of 2016.

The FY 2017 President's Budget requests funding to continue development of the OR SSBN. The first-of-class ship is to be procured in FY 2021, with Shipbuilding and Conversion, Navy (SCN) funding for detail design commencing in 2017 and advance procurement for long lead time material commencing in 2019. Previous modernizations of the strategic deterrent and nuclear security enterprise were accompanied by topline increases.

The Navy greatly appreciates Congressional support in overcoming the challenges posed by funding the OR Program. The procurement authorities such as Economic Order Quantity, Advance Construction, and Incremental Funding, provided in the FY 2016 National Defense Authorization Act are not required in FY 2017. However, the Navy will work with Congress in 2016 to provide details regarding how these authorities contribute to achieving the overarching objectives of delivering the OR capability on schedule and in the most affordable manner. The 2017 President's Budget continues to request funding for the OR Program via the SCN and Research, Development, Test and Evaluation, Navy (RDT&E,N) appropriations to ensure the same level of transparency, accountability, and adherence to financial management principles and policies as all other shipbuilding programs.

The FY 2017 President's Budget requests full funding for two SSN 774 *Virginia* class submarines and advance procurement for the FY 2018 and FY 2019 vessels. The *Virginia* class submarine program has delivered the last eight ships on budget and ahead of schedule. 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 over two months early with the least number of deficiencies of any *Virginia* class submarine to date. The Block IV contract for ten ships continues the co-production of the *Virginia* class submarines between GDEB and Huntington Ingalls Industries - Newport News Shipbuilding (HII-NNS) through FY 2018. The savings realized with this Multi Year Procurement (MYP) contract was over $2 billion, effectively giving the Navy "ten ships for the price of nine". The Navy intends to build on these savings and capitalize on increased efficiency and decreased costs with a *Virginia* class Block V MYP contract for up to 10 boats, planned for FY 2019.

The Navy's four SSGNs, provide significant undersea strike capability and SOF capability. To mitigate the 60 percent reduction in undersea strike capacity when these boats retire in FY 2026 - FY 2028, the Navy is investing in the *Virginia* Payload Module (VPM). VPM will include a hull insert amidships of a *Virginia* class submarine that will contain four 87-

inch diameter missile tubes each capable of launching seven TOMAHAWK cruise missiles utilizing the same Multiple All-Up Round canisters currently in use on SSGNs. The FY 2017 President's Budget continues VPM Research and Development and starts SCN funding for detail design and long lead time material efforts to enable integrating VPM into Block V *Virginia* class SSNs starting with one in FY 2019 and then increasing procurement to all the remaining Block V ships starting in FY 2020. Additionally, the FY 2017 President's Budget includes funding for Acoustic Superiority (AS) initiatives to be incorporated in Block V and later *Virginia* class SSNs. AS addresses the Chief of Naval Operations' (CNO's) undersea dominance mandate to pace the future threat and is comprised of an enhanced hull treatment, the addition of a large vertical array, and selected machinery quieting changes.

In 2014, the Navy led a comprehensive government-Industry assessment of shipbuilder construction capabilities and capacities at GDEB and HII-NNS to formulate the Submarine Unified Build Strategy (SUBS) for concurrent OR and *Virginia* class submarine production. This build strategy's guiding principles are: affordability, delivering OR 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. To execute this strategy, GDEB has been selected as the prime contractor for OR with the responsibilities to deliver the twelve OR submarines. HII-NNS will design and construct major assemblies and OR modules leveraging their expertise with *Virginia* construction. Both shipbuilders will continue to deliver *Virginia* class submarines throughout the period with GDEB continuing its prime contractor responsibility for the program. Given the priority of the OR Submarine Program, the delivery of *Virginia* class submarines will be adjusted with HII-NNS performing additional deliveries. Both shipbuilders have agreed to this build strategy.

In addition to the Department of the Navy's budget request, the continued support of Congress for Naval Reactors' Department of Energy (DOE) funding is vital to the Navy mission and ensuring the safe, reliable and enduring operations of the nuclear-powered Fleet. The President's FY 2017 DOE budget fully funds Naval Reactors request for the OR SSBN. This funding is critical to maintain the reactor design and development in synch with the Navy shipbuilding schedule to support lead ship procurement in 2021. The DOE budget submission also provides full funding for refueling the Land-based Prototype. This effort not only supports development of the OR SSBN life-of-the-ship core, but also ensures Naval Reactors continues to train about 2,000 nuclear-qualified sailors per year for the next twenty years. Naval Reactors'

DOE budget also includes funding for the Spent Fuel Handling Project. Recapitalizing this capability is critical to the Navy's tight refueling and defueling schedule of nuclear-powered aircraft carriers and submarines.

Large Surface Combatants

Guided missile cruisers (CGs) and guided missile destroyers (DDGs) comprise our large surface combatant fleet. These ships fulfill broad mission requirements both independently and in conjunction with a strike group with demands for increased capability and capacity in Ballistic Missile Defense (BMD) and Integrated Air and Missile Defense (IAMD), a continued focal point. In order to meet the increased demand for BMD, the Navy forward deployed four BMD capable DDGs, USS *Donald Cook* (DDG 75) and USS *Ross* (DDG 71) in FY 2014, and the USS *Carney* (DDG 64) and USS *Porter* (DDG 78) in FY 2015 to Rota, Spain. Additionally, the BMD ships USS *Benfold* (DDG 65) and USS *Barry* (DDG 52) departed in October 2015 and January 2016 respectively to forward deploy to Yokosuka, Japan. The Anti-Submarine Warfare (ASW) combat systems on DDGs and CGs are also being upgraded, bringing significant improvements over legacy systems.

The *Arleigh Burke* class (DDG 51) program remains one of the Navy's most successful shipbuilding programs with 62 ships currently operating in the Fleet. The FY 2017 President's Budget includes funding for two destroyers to execute the final year of the current MYP. Both ships will incorporate Integrated Air and Missile Defense and provide additional BMD capacity known as Flight III, which incorporates the Air and Missile Defense Radar (AMDR) and will deliver this much needed capability, essential for future sea-based BMD, to the Fleet in the early FY 2020s. The $1 billion of incremental funding provided by Congress in the FY 2016 budget for an additional DDG underscores the importance of these ships. The Navy will keep Congress advised throughout 2016 as we develop plans to award this ship.

AMDR is the future multi-mission radar of the Navy's surface combatant fleet, which will meet the growing ballistic missile threat by improving radar sensitivity and enabling longer range detection for engagement of increasingly complex threats. The AMDR radar suite will be capable of providing simultaneous surveillance and engagement support for long range BMD and area defense. The program continues to demonstrate maturity in its design development including the successful completion of the AMDR System Critical Design Review and the successful design verification testing conducted thus far in the early stages of developmental

testing. Detail design efforts for the DDG Flight III design will continue in FY 2016, ultimately leading to over 90 percent detail design completion prior to start of construction on the first Flight III ship in FY 2016.

The DDG 1000 *Zumwalt* class guided missile destroyer will be 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. In addition to the ship's two 155mm Advanced Gun Systems capable of engaging targets with the Long Range Land Attack Projectiles, the ship will be capable of conducting ASW, Anti Air Warfare (AAW), land attack, and will provide valuable advancements in technology such as signature reduction (both acoustic and radar cross-section), active and passive self-defense systems, enhanced survivability features, and shipboard automation (in support of reduced manning). The DDG 1000 program accomplished several construction milestones in 2015 including an initial sequence of sea trials which tested the ship's hull, mechanical, and electrical systems. DDG 1000 will complete sea trials for Navy acceptance in the early part of 2016 and deliver to the Navy later this year.

Small Surface Combatants

LCS enables the Navy to implement the Defense Strategic Guidance (DSG) directive to develop innovative, low-cost, and small-footprint approaches to achieve our security objectives. The modular, open systems architecture inherent in LCS allows for rapid, affordable integration of new warfighting capabilities as technology evolves. LCS is designed to fill critical warfighting gaps assigned to the small surface combatant force across the full range of military operations while also fulfilling naval global commitments in operations other than war. LCS design characteristics (speed, agility, shallow draft, payload capacity, reconfigurable mission spaces, air/water craft capabilities) combined with its core command, control, communications, computers and intelligence (C4I); sensors; and weapons systems, allow LCS to bring unique strengths and capabilities to the mission.

The Fast Frigate will incorporate significant improvements in lethality, survivability and capability from the LCS baseline configuration. The ship will provide multi mission ASuW and ASW capabilities as well as continuous and effective air, surface and underwater self-defense capabilities. The Frigate will be equipped with over-the-horizon (OTH) surface-to-surface

missiles (in addition to LCS baseline Surface Warfare (SUW) and ASW Mission Package (MP) capabilities), and additional upgrades to combat and electronic warfare systems.

The 2014 FSA update outlines the requirement for 52 Small Surface Combatants (SSCs) and determined a need for 26 deployed SSCs to meet the Navy's global peacetime and wartime requirement. The Navy's 2016 Long Range Shipbuilding Plan and the FY2016 Future Years Defense Plan (FYDP) included procurement of 14 LCS/Fast Frigate (FF) ships in FY2017-2021. In order to balance current and future capability needs within the FY 2017 top line constraints, the procurement plan for LCS/FF was reduced to seven ships within the FYDP and the overall inventory objective was reduced from 52 to 40 ships. The Navy will evaluate the risk associated with this budget decision, in the broader context of total large and small surface combatant ship inventory, in the course of the 2016 FSA update to inform future shipbuilding plans.

The FY 2017 President's budget requests funding for the Navy to competitively award one LCS to each shipbuilder and solicit block buy LCS proposals from each shipbuilder, to be submitted with their 2017 ship proposals. Additionally, it includes a request for RDT&E,N funding to proceed with completion of respective Frigate designs. A competitive down-select to a single shipbuilder is planned for FY2019, but potentially as early as FY2018 based on the proposed Frigate design and the modified block buy cost. This acquisition strategy sustains the two shipbuilders competing for the single ship awards in FY 2017 while enabling competitors to align long term options with their vendor base in support of the subsequent down-select, and accelerates delivery of the desired more lethal and survivable Frigate capability to the Fleet. Additionally, the plan preserves the viability of the industrial base in support of a pending decision regarding Foreign Military Sales opportunities, all the while preserving future decision space regarding the Frigate procurement should further future changes to operational requirements, budget, or national security risk dictate the need.

It is recognized that this down-select decision places one of our shipbuilders and part of the support industrial base at risk of closure. The Navy will use this current period of stable production – prior to the down-select decision – to thoroughly assess the impact of such potential closure on our strategic shipbuilding industrial base, the cost of our shipbuilding program, and our ability to support in-service ships, in order to identify appropriate actions to mitigate these impacts to the extent practical.

The LCS Mission Modules program provides focused Mission Packages for LCS that address critical Navy SUW, Mine Countermeasures (MCM), and ASW gaps identified in the

2004 Assured Maritime Access in the Littorals Initial Capabilities Document. The LCS Mission Modules program continues to field capability incrementally as individual mission systems become available in order to fill these critical warfighting gaps. The SUW Mission Packages are being introduced in three phases, providing capability to address Fast Attack Craft and Fast Inshore Attack Craft in the littorals, and maritime security and escort roles previously assigned to *Oliver Hazard Perry* class Frigates and *Cyclone* class patrol ships. MCM Mission Packages are being fielded in four phases delivering capability to address maritime mines and to replace legacy *Avenger* class Mine Countermeasures ships and MH-53E Sea Dragon helicopters that are nearing the end of service life. The ASW Mission Package will be delivered in a single phase and provides counter-submarine capability in littoral and deep water environments, High Value Unit (HVU) ASW escort and barrier patrol capability.

Increment 1 of the SUW Mission Package has completed Initial Operational Test & Evaluation (IOT&E) and is successfully deployed on the USS *Fort Worth* today. The initial phase of IOT&E for the Increment 2 SUW MP, aboard an Independence-variant ship, was completed in September 2015. A subsequent phase of IOT&E will be conducted in the Summer of FY 2016, following upgrades to the ship's Integrated Combat Management System and SeaRAM weapon system. USS *Fort Worth* (LCS 3), with an embarked SUW MP, is currently on an extended operational deployment based out of Singapore. This SUW MP includes the first time deployment of a combined MQ-8B Fire Scout Vertical Take-off Unmanned Aerial Vehicle and a MH-60R helicopter aviation detachment. Finally, the Navy completed the second in a series of Guided Test Vehicle launches of the Army's Hellfire Longbow missile in December 2015 to evaluate performance of the Surface-to-Surface Missile Module launcher and missile system in a littoral environment. The demonstration showed that the vertically-launched missiles could effectively acquire, discriminate and engage the representative targets.

Technical Evaluation (TECHEVAL) of the Increment 1 MCM MP was completed in August 2015, aboard USS *Independence* (LCS 2). The Mission Package met the majority of its sustained area coverage rate test requirements, but significant reliability issues were noted with the Remote Multi-Mission Vehicle (RMMV) and associated subsystems. Based on TECHEVAL results, CNO and ASN (RDA) chartered an Independent Review Team to assess the Remote Minehunting System (RMS). The review team recommended halting the procurement of the RMMV Low Rate Initial Production (LRIP) 2 and recommended pursuing acceleration of other promising near term technologies to accomplish the MCM mission. The Navy will coordinate

with all stakeholders, particularly the Fleet, in developing the way ahead for this important capability.

The ASW Mission Package, which comprises a continuously active variable depth sonar, multi-function towed array, and a torpedo defense capability, is conducting Developmental Testing (DT). The ASW MP is on track to complete DT in FY 2017 with IOT&E in late FY 2018.

Amphibious Ships

Amphibious ships operate forward to support allies, 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. Amphibious forces comprised of Sailors, Marines, ships, aircraft and surface connectors provide the ability to rapidly and decisively respond to global crises without a permanent footprint ashore that would place unnecessary political or logistical burdens upon our allies or potential partners. There are two main drivers of the amphibious ship requirement: maintaining persistent forward presence, which enables both engagement and crisis response, and delivering the assault echelons of Marine Expeditionary Brigades (MEB) for joint forcible entry operations.

The CNO and Commandant of the Marine Corps have determined that the force structure for amphibious lift requirements is 38 amphibious ships, fiscally constrained to 34 ships. Balancing the total naval force structure requirements against fiscal projections imposes risk on meeting this requirement. Based on the footprint of a 2.0 MEB assault echelon force and assuming 90 percent operational availability, a minimum of 30 operationally available ships is assumed for operational planning. This would require a force made up of ten Amphibious Assault Ships (LHD/LHA), ten Amphibious Transport Docks (LPD) and ten Dock Landing Ships (LSD). At the end of FY 2017, the Amphibious Force Structure will be 32 ships (9 LHD/LHAs, 11 LPDs, and 12 LSDs) increasing to 34 ships throughout the 2020s and 2030s. The Navy plans to maintain 11 deployable LSDs in the active force until LX(R) delivers by rotating three LSDs to complete phased modernizations beginning in FY 2016. This will extend USS *Whidbey Island* (LSD 41), USS *Germantown* (LSD 42), and USS *Tortuga* (LSD 46) to provide 40 years of operational service life. This plan mitigates presence shortfalls and supports 2.0 MEB Assault Echelon shipping requirements.

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, which have all decommissioned as of 2015, and the aging LHD 1 *Wasp* class ships as they begin decommissioning in the late 2020s. USS *America* (LHA 6) and *Tripoli* (LHA 7) are optimized for aviation capability and do not include a well deck. USS *America* completed a portion of its Operational Test and Evaluation activities in San Diego, CA and commenced PSA in May 2015. The ship is scheduled to complete PSA in Spring 2016 and will subsequently complete further operational testing and training. As of January 2016, LHA 7 construction is 41 percent complete and on schedule to deliver in 2018.

LHA 8, the first Flight 1 ship, will have a well deck to increase operational flexibility and a smaller island that increases flight deck space to enhance aviation capability. The Navy completed the LHA 8 early industry involvement affordability phase in FY2015 in which 300 cost reduction initiatives were developed by industry and the Navy and Marine Corps. The affordability cost reduction initiatives drove technical and production improvements throughout the ship design culminating in the ship specification issued to industry for more affordable ship design and construction. LHA 8 is currently in competitive source selection as part of an amphibious and auxiliary shipbuilding acquisition strategy to support stability and affordability for this sector of the industrial base. Long lead time material procurement and detail design is scheduled to begin in June 2017, construction is funded in FY 2017 and FY 2018 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, *John P Murtha* (LPD 26) and *Portland* (LPD 27), and will deliver in Summer 2016 and 2017, respectively. The balance of funding for LPD 28 was provided in FY 2016. LPD 28 will possess all of the key fundamental capabilities and characteristics associated with LPDs 17 through 27, to include command and control, aviation operations and maintenance, well deck operations, and medical and will also incorporate system updates due to obsolescence. LPD 28's design and construction features will, at the same time, exploit 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. The

procurement of LPD 28 will also assist in mitigating critical impacts to shipbuilding and combat systems industrial bases caused by the gap in ship construction, pending the award for LX(R) procurement.

LX(R) is the replacement program for the landing ship dock, LSD 41 and LSD 49 classes, which will begin reaching their estimated service life in the mid-2020s. LX(R) is envisioned to be a flexible, multi-mission warship with capabilities that support execution of the full range of military operations. The need to support disaggregated or split operations away from the Amphibious Ready Group or to deploy independently is a key driver for the design of this ship class. The inherent flexibility of amphibious ships is demonstrated by their support to seven of the 10 missions in the DSG. LX(R) will leverage mature design using the LPD-17 hull form while balancing cost and requirements to deliver key capabilities. The lead LX(R) will deliver in FY2025 in advance of LSD 43's retirement in FY 2027.

The Consolidated Appropriations Act, 2016 added funding for the acceleration of LX(R) and the program focus during FY 2016 will be on validating the requirements in the Capability Development Document and executing contract design efforts. The Navy will initiate key long lead time material procurements critical to maintaining a stable supplier base, and commence design efforts necessary to accelerate design activities to FY2019. This earlier start will enable design completion and start of construction up to a year earlier, and delivery in FY 2025, one year earlier than originally planned. The LX(R) contract design effort is part of the Navy's combined limited procurement acquisition strategy of LHA 8 and six T-AO(X) ships. Both General Dynamics NASSCO and Huntington Ingalls Industries, Ingalls Shipbuilding will be awarded a share of the LX(R) Contract Design, upon awards of LHA 8 and T-AO(X) contracts.

Auxiliary Ships

Support vessels such as the Expeditionary Sea Base (ESB, formerly Afloat Forward Staging Base), Expeditionary Transfer Dock (ESD, formerly Mobile Landing Platform) and the Expeditionary Fast Transport (EPF,formerly Joint High Speed Vessel) provide additional flexibility to the Combatant Commanders. The USNS *Montford Point* (ESD 1) and USNS *John Glenn* (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* (ESB 3), the first Afloat Forward Staging Base (AFSB) variant of the ESD, was delivered in June 2015. ESBs are flexible platforms capable of

hosting multiple mission sets with airborne, surface, and subsurface assets. The Navy started construction of ESB 4 in October 2015, and is planning for a FY 2016 award of the fifth ESB. While not a substitute for amphibious warships, the ESB will relieve pressure on our amphibious fleet in routine operations. 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. The Navy continues to explore opportunities to further enhance EPF's operational profile to support/enhance warfighter requirements such as Special Operations support, Maritime Interdiction Operations, and ISR missions. EPF 6 was delivered in January 2016 and production continues with EPFs 7-10. In FY 2016, Congress provided funding for a twelfth EPF and the Navy is currently issuing a Request for Proposal for construction of EPF 11 and 12.

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 T-AO and T-AKE ships serve as shuttle ships between resupply ports and their customer ships, while the T-AOE ships serve as station ships, accompanying and staying on-station with a Carrier Strike Group to provide fuel as required to customer ships. The Navy continued its efforts in 2015 to mature its concept for the replacement of the *Kaiser* class (T-AO 187) of Fleet Replenishment Oilers. The new replacement oilers, currently designated as T-AO(X), will be double-hulled and meet Oil Pollution Act 1990 and International Marine Pollution Regulations. The lead ship is funded in 2016 with serial production beginning in 2018. The total ship quantity is planned to be 17 ships.

Beginning in 2016, the Navy will begin 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 Navy appreciates the efforts of Congress to bolster the force structure and support the industrial base with the FY 2016 accelerated funding for T-ATS and ESB.

Surface Ship Modernization

The fiscal realities facing the Navy make it imperative that we modernize and extend the service lives of our in-service ships to meet the FSA requirements. The bulk of our current surface fleet was procured in the late 1980s and 1990s, and as such will reach the end of their service lives and retire at the same rate creating inventory shortfalls across the battle force. An important element of mitigation is the extension and modernization of our *Arleigh Burke* class DDGs, *Ticonderoga* class cruisers, and LSD 41/49 class amphibious ships.

The FY 2017 President's Budget includes funding for the modernization of two destroyers to sustain combat effectiveness, ensure mission relevancy and to achieve the full expected service lives of the AEGIS Fleet. The destroyer modernization program includes HM&E upgrades as well combat systems improvements with upgraded AEGIS weapons systems Advanced Capability Build (ACB) 12 to include open architecture computing environment, BMD capability, installation of the Evolved Sea Sparrow Missile (ESSM), integration of the SM-6 missile, and improved air dominance with processing upgrades and Naval Integrated Fire Control-Counter Air capability. This renovation reduces total ownership costs and expands mission capability for current and future combat capabilities.

Cruiser modernization ensures long-term capability and capacity for purpose-built Air Defense Commander (ADC) platforms. Eleven recently modernized CGs (CG 52 – CG 62) will perform the ADC function for deploying Carrier Strike Group while the Navy modernizes the newest eleven ships (CG 63 – CG 73). The newly modernized CGs will replace the first eleven CGs on a one-for-one basis as each older ship reaches the end of service life (35 years) starting in FY 2020. To date, the Navy has modernized CGs 52-58 with the ACB 08 Combat System as well as substantial HM&E upgrades, and completed modernization on CGs 59, 60, and 62 with the improved ACB 12.

In FY 2015, the Navy inducted the USS *Cowpens* (CG 63) and USS *Gettysburg* (CG 64) into modernization. The next two CGs, USS *Vicksburg* (CG 69) and USS *Chosin* (CG 65), will be inducted in FY 2016. The modernization for these four ships is being executed in accordance with congressional legislation and is utilizing funding from the Ships Modernization, Operations, and Sustainment Fund (SMOSF). The induction of these ships also greatly supports industrial base workload. For example, our ability to accelerate the USS *Gettysburg* (CG 64) modernization is helping to mitigate the significant workload valley in the Hampton Roads area during 2016.

The FY 2017 President's Budget requests $521 million across the FYDP (in addition to current SMOSF funding) to support CG Modernization ($183 million in FY 2017) and proposes a CG/LSD modernization plan within this funding profile that ensures the long term capability and capacity for ADC platforms. This plan will save $3 billion over the FYDP compared to the current Congressionally mandated plan. The FY 2017 President's Budget supports the induction of an additional seven cruisers in FY 2017, phased to ensure completion, where applicable, of each ship's planned operational deployment prior to induction.

During modernization, costs avoided by minimizing manpower and operations and support provide a fiscal offset that partially funds the modernization itself. This plan paces the threat through the installation of the latest technological advances in combat systems and engineering and will provide the means to retain the best ADC and Marine expeditionary lift capabilities through the 2040s. The plan proposed in the FY 2017 budget provides significant cost savings within the FYDP, and Navy is fully committed to funding and completing modernization outside the FYDP. The Navy will continue to work with Congress to develop and evaluate funding options to mitigate the effects of the BBA and continue this vital modernization with adequate funding in FY 2017 and beyond.

Similarly, the Navy plans to perform the final *Whidbey Island* class midlife modernization as well as to extend two LSDs This plan completes the HM&E midlife and modernizes combat systems, engineering and ship's control, satellite communications, computers, and intelligence gathering capability on USS *Tortuga* (LSD 46) extending expected service life from 35 to 44 years. LSD 46 was inducted into modernization in December 2015 and is scheduled to return to the Fleet in FY 2019. Additional post-midlife modernization is planned for USS *Whidbey Island* (LSD 41) and USS *Germantown* (LSD 42) to execute structural, engineering, and combat systems modernizations to extend their expected service life. LSD 41 is planned for induction into modernization in FY 2020.

Combat Systems

The Navy continues to field the most capable and lethal surface and submarine combat systems in the world. The combination of forward stationed and rotationally deployed AEGIS Baseline 9 cruisers and destroyers is a uniquely adaptable means to maintain global military presence while respecting the sovereignty of other nations. The forward presence of these large surface combatants provides an expansive range of options to influence events and project power

in peacetime, crisis and war. AEGIS Baseline 9 incorporates advances in technology and keeps pace with emerging threats using networked-based, commercial off-the-shelf computing system infrastructures to bring increased warfighting capabilities. The related AEGIS Common Source Library (CSL) enables software reuse and commonality across all modern AEGIS Combat System configurations: Air Defense Cruisers, IAMD Destroyers, New Construction IAMD Destroyers, and AEGIS Ashore.

To ensure the Navy maintains its defensive capability in the next decade and beyond, the Department is pursuing affordable defensive systems that are employable from multiple platforms. The use of spiral development has been utilized to acquire and field the newest surface ship electronic warfare systems. Under the Surface Electronic Warfare Improvement Program (SEWIP), we are replacing aging analog electronic warfare defensive systems first fielded in the early 1970's with new, digital systems. The first SEWIP program, Block 1, provides a digital backbone and highly sensitive receivers, while SEWIP Block 2 will add larger receivers to detect the current and projected future threats in the electromagnetic spectrum. These two spirals completed a highly successful deployment, aboard USS *Bainbridge* (DDG 96) in 2015. The SEWIP Block 3 program, entering its engineering and manufacturing development phase now, will add an active jamming system. Block 3 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 with these new telemetries will be awarded in FY 2016. Progress in development of the Large Vertical Array continues on track in support of the Acoustic Superiority program.

Surface Navy ASW is evolving to an active sonar approach to counter advanced submarine capabilities. The AN/SQQ-89(V) sonar system processes active and/passive sensor data from the hull-mounted and towed arrays, and sonobuoys. We have installed over 30 SQQ-89 systems which include the multi-function towed array for extended passive detection. Additionally, the LCS ASW MP remains on track to achieve Initial Operational Capability (IOC) in FY 2018. LCS with the ASW MP is capable of detection and tracking of submarines at extended ranges via multiple convergence zones. The ASW MP leverages existing and fielded

technology, including a continuous active sonar/variable depth sonar (CAS/VDS), the multi-function towed array (MFTA), a command and control module, a torpedo defense module, and an aviation module.

Weapons

The Navy has made 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. SM-6 testing between March 2015 and January 2016 achieved maximum range, reliability and multi-mission capability goals. The Evolved Sea Sparrow Missile (ESSM) program awarded the Block 2 Engineering Manufacturing and Development contract in 2015, which will leverage the SM-6 active guidance section architecture to improve ship self-defense performance against stressing threats and environments. Rolling Airframe Missile (RAM) Block 2 achieved IOC in May 2015, providing improved terminal ship defense through higher maneuverability and improved threat detection.

The FY 2017 President's budget includes funding to upgrade 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. (Potential $2 billion savings compared to filling the entire area defense inventory needs with the SM-6 Block 1A missiles.)

Affordability continues to be a focus for weapons. International cooperation on ESSM and RAM results in our allies sharing 50 percent or more of the program costs. By leveraging investment in previous designs, the Navy's development, production, and maintenance costs are reduced. The increased capabilities inherent in these new designs can also support the use of these weapons in additional roles thereby creating multi-mission weapons from existing designs. The FY 2017 President's Budget provides the funds required for these critical activities.

The Department's Cruise Missile Strategy is fully funded in the PB17 budget submission. Developmental and sustaining efforts of this strategy include: support of Tomahawk Land Attack Block III and Tactical Tomahawk (TACTOM) Block IV through anticipated service lives; integration of modernization and obsolescence upgrades to TACTCOM during a mid-life recertification program (which adds 15-years of additional missile service life), fielding of the Long Range Anti-Ship Missile (LRASM) as the Offensive Anti-Surface Warfare (OASuW)

Increment 1 material solution to meet near to mid-term threats, and development of follow-on Next Generation Strike Capability (NGSC) weapons to address future threats and to replace or update legacy weapons, while bringing next generation technologies into the Navy's standoff conventional strike capabilities. NGSC will address both the OASuW Increment 2 capabilities to counter long-term anti-surface warfare threats, and the Next Generation Land Attack Weapon (NGLAW) to initially complement, and then replace, current land attack cruise missile weapon systems.

Tomahawk provides an attack capability against fixed and mobile targets and can be launched from both surface ships and submarines. The current variant's, TACTOM, improvements include in-flight retargeting, the ability to loiter over the battlefield, in-flight missile health and status monitoring, and battle damage indication imagery, providing a digital look-down "snapshot" of the battlefield via a satellite data link. As part of our distributed lethality plan, the Navy will also commence development of an all-weather seeker into the Block IV Tomahawk weapon system.

The FY 2017 budget request supports the completion of technology maturation and initiation of integration and test of the air-launched OASuW/Increment 1 program and procurement of the initial All-Up-Round weapons. Increment 1 provides Combatant Commanders the ability to conduct ASuW operations against high value surface combatants and denies adversaries the sanctuary of maneuver. The program has completed transition from Defense Advanced Research Projects Agency to Navy leadership and is scheduled to field on the B-1 by the end of FY 2018 and F/A-18E/F by the end of FY 2019.

To ensure Navy maintains its strike capability in the next decade and beyond, the Department is pursuing an overarching NGSC strategy to develop a family of more lethal, survivable, and affordable multi-mission standoff weapons employable from multiple platforms. The family of NGSC weapons will be capable of attacking land and maritime, stationary and mobile targets while supporting two of the Navy's primary mission areas: power projection (land attack from the air/sea/undersea) and sea control against enemy surface action groups and other combatants (ASuW). To the maximum extent possible, the Navy plans to utilize common components and component technologies (e.g. navigation, communications, seeker, guidance and control) to reduce cost, shorten development timelines, and promote interoperability. Based on performance requirements and launch parameters, it is likely the missile airframes and propulsion systems will differ between the air-launched and sea-launched weapons. The

NGLAW is planned as the follow-on surface/sub-surface launched long-range strike capability to address the 2028 (and beyond) land attack and ASuW threats and gaps. NGLAW is envisioned to complement, and then eventually replace, the Tomahawk Weapon System, which will be operational until the mid-late 2040s. OASuW Increment 2 is planned to address the long-term air-launched anti-surface warfare requirements for employment within advanced anti-access environments.

Affordability and the Shipbuilding Industrial Base

Stability and predictability are critical to the health and sustainment of the Nation's shipbuilding and combat systems industrial base. A healthy design and production industrial base is critical to achieving Department priorities and fulfilling Navy near term and long term needs. The shipbuilding industry, with its interdependent suppliers and vendors, is a complex system where today's decisions have a cascading effect both in the near-term and the future. Perturbations in naval ship design and construction plans are significant because of the long-lead time, specialized skills, and extent of integration needed to build military ships. Each ship is a significant fraction of not only the Navy's shipbuilding budget, but also industry's workload and regional employment. Consequently, the timing of ship procurements is a critical matter to the health and sustainment of U.S. shipbuilding and combat system industries, and has economic impacts at the regional and local levels. It is important, therefore, for the Department to provide stability and predictability to the industrial base, including key suppliers and vendors, to maintain our ability to continue to build the future Fleet as outlined in the long range shipbuilding plan.

While top-line budget reductions impose significant challenges and result in some uncertainty for portions of the industry, the Navy is committed to identifying and implementing solutions to stabilize and maintain the base. The Navy will continue to take prudent actions to contain and reduce costs, foster efficiency and sustain the industrial base. Key to cost containment and reduction is the implementation of innovative acquisition strategies that stabilize ship construction workload while maximizing competition within the industrial base. Just as vital for cost reduction is a focus on product design to include initiatives such as design for affordability and modularity, incorporation of combat system open architecture, design and ship specification stability, and strict control over change orders. Improved material management and selection, utilization of Economic Order Quantities and the pursuit of cross-program

common equipment buys further cost containment and reduction objectives. To foster efficiency, the Navy will continue to make investments to support shipyard facility improvements and the development of optimal build plans which support current and future ship construction.

In support of industrial base sustainment as well as cost reduction, the Navy will continue to stabilize procurements through utilization of block buys and Multi Year Procurements. Additionally, we will consider judicious use of Advance Procurement to bridge production gaps and sustain the vendor base while at the same time mitigating material risk and improving program schedule and cost performance. Navy support of shipbuilding capability preservation agreements and build strategies (such as SUBS) will also provide stability and improve potential for cost reductions. In addition to improving affordability in procurement, these strategies minimize life-cycle costs, improve and ensure quality products, facilitate effective and efficient processes, and promote competition - which all support Department priorities.

Naval Aviation

In support of the Vision for Naval Aviation 2025, the FY 2017 President's Budget supports integrated warfare at sea and from the sea with the construction of *Ford* class carriers, LX(R) amphibious ships, the Joint Strike Fighter (JSF), the E-2D, P-8A and development of unmanned aircraft. Furthermore, the Navy continues to fund new capabilities in the electromagnetic spectrum, missile kinematics, and aircraft system upgrades that will sustain U.S. maritime dominance.

Airborne Early Warning Aircraft

The E-2D Advanced Hawkeye (AHE) is the Navy's carrier-based Airborne Early Warning and Battle Management Command and Control system. The E-2D AHE provides Theater Air and Missile Defense 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. E-2D is also a cornerstone of the Naval Integrated Fire Control – Counter Air (NIFC-CA) system of systems capability. Utilizing the newly developed AN/APY-9 Mechanical/Electronic Scan Array radar and the Cooperative Engagement Capability (CEC) system, the E-2D AHE works in concert with tactical aircraft and surface-combatants equipped with the AEGIS combat system to

detect, track and defeat air and cruise missile threats at extended ranges. IOC was achieved in October 2014 and VAW-125 accomplished the first Fleet Squadron Deployment during March 2015 through November 2015.

The FY 2017 President's Budget requests funding for continued development to include: Aerial Refueling, Tactical Targeting Network Technology (TTNT), Secret Internet Protocol Router chat, Advanced Mid-Term Interoperability Improvement Program, Multifunctional Information Distribution System/Joint Tactical Radio System, Counter Electronic Attack, Sensor Netting, Data Fusion, Fighter to Fighter Backlink, and Electronic Support and Crypto Modernization/Frequency Remapping. Additionally, the FY 2017 budget requests procurement funding for six aircraft and Advance Procurement for FY 2018 aircraft in conjunction with the existing 2014-2018 MYP contract.

Maritime Patrol Aircraft

The P-8A Poseidon recapitalizes the Maritime Patrol ASW, ASuW and armed ISR capability currently resident in the P-3C Orion. The P-8A combines the proven reliability of the commercial 737 airframe with avionics that enables integration of modern sensors and robust communications. The P-8A's first operational deployment was completed in June 2014, and continuous 7th Fleet operational deployments are underway. As of December 2015, five Fleet squadrons have completed transition to P-8A and a sixth is underway. All Fleet squadrons are scheduled to complete transition by the end of FY 2019. The P-8A program is meeting all cost, schedule and performance parameters in accordance with the approved Acquisition Program Baseline. The aging P-3 Orion fleet will continue to provide critical ASW, ASuW and ISR support for joint and naval operations worldwide until the Fleet completes transition to P-8A.

The EP-3E Aries is the Navy's premier manned Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) platform. The Joint Airborne Signals intelligence (SIGINT) Common Configuration includes Multi-Intelligence sensors, robust communication, and data links employed by the flexible and dependable P-3 air vehicle to ensure effective MISR&T support across the full Range of Military Operations. The FY 2011 National Defense Authorization Act directed Navy to sustain EP-3E airframe and mission systems relevance to minimize SIGINT capability gaps until the systems are fully recapitalized with a platform or family of platforms that in the aggregate provide equal or better capability and capacity. The FY

2017 request procures 47 P-8As over the FYDP and maintains the EP-3E retirement dates in FY 2020.

Fixed Wing Aircraft

Fielded throughout our active force, the KC-130J brings increased capability, performance and survivability with lower operating and sustainment costs to 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 2016, the KC-130J remains in high demand, providing tactical air-to-air refueling, assault support, Close Air Support (CAS) and Multi-sensor Imagery Reconnaissance (MIR) capabilities, in support of Special Purpose MAGTFs and deployed MEUs.

The Navy implemented plans to procure two KC-130Js per year starting in FY2016 and to continue product improvements. Targeted improvements include aircraft survivability through advanced electronic countermeasure modernization and obsolescence upgrades to the Harvest HAWK ISR/Weapon Mission Kit.

The Marine Corps has funded 65 of the 79 KC-130J aircraft through FYDP. The three aircraft included in the FY 2013 budget would have completed the Active Component (AC) requirement of 51 aircraft. However, the Marine Corps began using the AC backup aircraft to accelerate the Reserve Component (RC) transition from the legacy KC-130T aircraft to the more capable and efficient KC-130J in FY2014. The aircraft requested in the FY2017 President's Budget will continue to increase KC-130J inventory as we strive to achieve Full Operational Capability in the RC. Delays in procurement would force the Marine Corps to sustain the KC-130T aircraft longer than planned at an increased cost.

Expeditionary Warfare

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 maneuver ashore and force entry once there. That ability is provided through the combination of connectors to move the ground force

from the sea base to the ashore objective and the organic capability of the ground force to maneuver and fight ashore.

Connectors

The Seabasing Joint Integrated Concept 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 President's FY 2017 requests $128 million for new Ship to Shore Connector (SSC) air cushioned vehicles and additional funding across the FYDP for procurement. The SSC is the replacement for the aging LCACs which have undergone service life extension programs (SLEP) and a Post SLEP sustainment program to mitigate the gap as the SSC is developed and fielded. Additionally, funding was provided in FY 2016 to accelerate the procurement of the LCU-1700 Program (formerly known as the Surface Connector (X)-Recapitalization (SC(X)) program), which is planned to recapitalize the aging LCU 1610 class.

These platforms are essential in connecting the combat power and logistical sustainment that the sea base provides, with the forces that are operating in the littorals and inland for all 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.

Ground Forces

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

Ground Combat and Tactical Vehicles (GCTV)

The Marine Corps GCTV portfolio modernization programs account for approximately 50 percent of the Marine Corps ground modernization investment. The overarching priority within the GCTV portfolio is the replacement of the legacy Amphibious Assault Vehicle (AAV)

with modern armored personnel carriers (APCs) through a combination of complementary systems. The Amphibious Combat Vehicle (ACV) program is the Marine Corps' highest ground modernization priority and will use an evolutionary, incremental approach to replace the aging AAVs with a vehicle that is capable of moving Marines ashore, initially with surface connectors and ultimately as a self-deploying vehicle. ACV consists of two increments, ACV 1.1 and ACV 1.2. Increment 1.1 will field a personnel carrier with technologies that are currently mature. Increment 1.2 will improve upon the threshold mobility characteristics of ACV 1.1 and deliver C2 and recovery and maintenance mission role variants.

ACV Phase 1.1 modernizes 2 of our 10 amphibious vehicle companies. The AAV Survivability Upgrade Program (SUP) improves AAV capability in four of the 10 companies, in order to support MEU deployments and when globally sourced, provide the essential capacity necessary for the assault echelons of two MEBs. ACV Phase 1.2 will modernize the remaining four of 10 companies. This combination of a modern amphibious armored personnel carrier alongside the improved AAV generates a complementary set of capabilities to meet general support lift capability and capacity requirements of our Ground Combat Element.

In parallel with these modernization efforts, a science and technology portfolio is being developed to explore a range of high water speed technology approaches to provide for an affordable, phased modernization of legacy capability to enable extended range littoral maneuver. These efforts will develop the knowledge necessary to reach an informed decision point in the mid-2020s on the feasibility, affordability, and options for developing a high water speed capability for maneuver from ship-to-shore.

The second highest priority within the portfolio remains the replacement of a 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 of the entire GCTV portfolio while replacing about one third (5,500 vehicles) of the legacy HMMWV fleet with modern tactical trucks prior to the fielding of ACV 1.1.

Amphibious Combat Vehicle 1.1

The ACV 1.1 program successfully leveraged technology demonstrations and competitive prototyping to create a set of realistic requirements that are achievable with a non-

developmental vehicle. Market research and extensive discussions with industry confirmed that requirements could be met with low-risk, affordable solutions. The use of demonstrated mature technologies and stable requirements reduced technical risk and allowed foregoing the Technology Maturation and Risk Reduction (TMRR) phase, accelerating IOC. The condensed EMD phase will focus on manufacturing and testing rather than system design. An acquisition strategy including affordability constraints and competition through to LRIP will continue to ensure affordability. An extensive test and evaluation phase will begin upon delivery of the 16 prototype vehicles per contractor in FY 2017. The acquisition objective (AO) of 204 vehicles will provide lift for two infantry battalions and will achieve IOC in FY 2020. The aggressive acquisition schedule for ACV 1.1 requires full funding and support from Congress. This budget includes $158.7 million in RDT&E for the ACV program.

AAV Survivability Upgrade Program (AAV SUP)

AAV SUP is a well-defined program to increase the capability of the current vehicle by providing force protection upgrades to counter current and emerging threats to the underside of the vehicle. Specifically, the program will provide improved armor, spall liners, blast mitigating seats and protected fuel storage. These improved AAVs will play an essential role in facilitating ship-to-shore mobility until replaced via a future phase of the ACV program. FY 2017 funding supports continuation of the EMD phase and associated prototype testing. The AO for the program is 392 vehicles with IOC in FY 2019. This budget includes $38.0 million in RDT&E and $73.8 million in PMC for the AAV SUP.

Joint Light Tactical Vehicle (JLTV)

The Department remains firmly partnered with the U.S. Army in fielding a JLTV that lives up to its name, while also being affordable. JLTV will deliver a modern reliable truck with M-ATV protection and unarmored HMMWV land mobility and transportability performance to begin replacing the highest risk portions of our light fleet in 2018. The JLTV has effectively controlled ownership costs by maximizing commonality, reliability, and fuel efficiency, while achieving additional savings through effective competition in all stages of program execution. With a production contract for both LRIP and Full Rate Production options awarded in 2015, funding requested in this budget will support test and evaluation, technical, and logistical

activities. This budget includes $23.2 million in RDT&E and $113.2 million in PMC for the USMC portion of JLTV.

Ground Force Command and Control

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.

Ground/Air Task Oriented Radar (G/ATOR)

G/ATOR will support air defense, air surveillance, counter-battery/target acquisition, and aviation radar tactical enhancements; the final evolution will also support the Marine Corps air traffic control mission. G/ATOR Block 1 provides air defense and air surveillance capability, achieved Milestone C in 2014 and is currently in production (LRIP). G/ATOR Block 2 provides counter-battery/target acquisition and is in the EMD phase of acquisition. Funding in this budget ($83.5 million in RDT&E) supports the continued development of G/ATOR Block 2, transition to Gallium Nitride module technology, and procurement funding ($135 million) supporting three G/ATOR Block 2 systems.

Common Aviation Command and Control System (CAC2S)

Phase I Limited Deployment Capability was achieved second Quarter 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 is scheduled for the third quarter of FY 2016 with fielding to begin in FY 2017. The approved AO is 50 systems. This budget includes $11.8 million for RDT&E and $47.4 million in PMC.

Other Ground 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.

Unmanned Systems

The Department of the Navy has placed a priority on the development of unmanned systems leading to a fully integrated manned and unmanned fleet. Unmanned technology will not replace our Sailors and Marines, instead it will unlock their full potential as we integrate this technology with our total forces.

Currently, our warfare communities - air, sea, undersea and ground - are all doing superb work in unmanned systems and integrating them into the existing architecture within their own framework, but as this technology becomes more complex and widespread, ensuring we have a cohesive management function is critical to maintaining our superiority across all domains, and possibly even multiple domains.

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 RAQ-25, a restructured variant of the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) program, will enhance carrier capability and versatility for the Joint Forces Commander through integration of a persistent, sea-based, multi-mission aerial refueling and reconnaissance Unmanned Aircraft System (UAS) into the Carrier Air Wing (CVW). The RAQ-25 system is envisioned to be an integral part of the future CVW; its robust organic refueling and long-endurance ISR capability, coupled with future limited precision strike, is core to the CVW of the future. The majority of the previous UCLASS data and all ongoing work will directly translate to the RAQ-25 program. Ongoing Carrier modifications to prepare Mission Control Spaces and integrate UCLASS architecture will be leveraged for RAQ-25, as will the Control System and Connectivity segment and the Common Control System programs currently in development. RAQ-25 significantly extends CVW mission effectiveness range, addresses the current Carrier Strike Group organic ISR shortfall and future CVW-tanker gap, and offloads the tanking mission from the F/A-18E/F to help mitigate the naval Strike Fighter shortfall. As the first carrier-based, Group 5 UAS, RAQ-25 will pioneer

the integration of manned and unmanned operations, mature complex sea-based refueling and C4I UAS technologies and pave the way for more multifaceted multi-mission UAS to pace emerging threats. The Navy is proceeding with formal requirements definition and related specifications development for the RAQ-25 system while continuing to leverage the robust competitive industry that has participated in UCLASS Preliminary Design, in order to further advance the RAQ-25 design concept and reduce technical risk inherent to this first of type carrier-based UAS capability.

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. The Navy currently maintains an inventory of four USAF Global Hawk Block 10 UAS, as part of the Broad Area Maritime Surveillance Demonstration program. These aircraft, which have been deployed to CENTCOM's AOR for over seven years, have achieved over 18,000 flight hours in support of CENTCOM ISR tasking and are adequate to cover all Navy needs through FY 2018.

Triton will commence the first of five globally-distributed, persistent maritime ISR orbits beginning in FY 2018, as part of the Navy's Maritime ISR&T transition plan. MQ-4C Triton test vehicles have completed 53 total flights as of January 2016 and are continuing sensor flight testing. An Operational Assessment was completed in December 2015 in support of Milestone C, planned for FY 2016. The FY 2017 President's Budget requests $405 million in RDT&E,N to continue Triton development activities and $579.2 million of Aircraft Procurement, Navy for procurement of the second lot of LRIP aircraft and spares and for procurement of long lead materials for the first lot of Full Rate Production aircraft.

The MQ-8 Fire Scout is an autonomous ship-based, vertical take-off unmanned air system that includes two airframe types, the MQ-8B and MQ-8C. The MQ-8C is a larger, more capable and more cost-effective airframe that uses the same ground control station, avionics and payloads as the MQ-8B. The systems are designed to operate from any suitably-equipped air-capable ship, carry modular mission payloads, and operate using the Tactical Control System and Line-Of-Sight Tactical Common Data Link.

The MQ-8B has completed ten operational deployments and flown more than 15,000 operational hours, including: deployments to Afghanistan from May 2011 until August 2013 for more than 5,100 dedicated ISR flight hours in support of U.S. and coalition forces; more than 8,100 hours on Navy Frigates; and 130 hours aboard Littoral Combat Ships performing more

than 2,000 autonomous ship board take-offs and landings in support of Special Operations Forces and Navy operations. The MQ-8B is deployed today with HSM-35 in a composite aviation detachment with a MH-60R on USS Fort Worth (LCS-3), and will deploy with a maritime search radar capability this Fiscal Year. Integration with the Coastal Battlefield Reconnaissance and Analysis MCM capability with the MQ-8B airframe is underway.

The MQ-8C Fire Scout has flown more than 745 flight hours conducting developmental testing, and completed 84.2 flight hours during its successful completion of a land based Operational Assessment in the first quarter of FY 2016. IOC is planned for 1st Quarter FY 2018. The Navy is executing efforts for integration of a radar capability into the MQ-8C, and is planning to integrate the Advance Precision Kill Weapon System II (APKWS II) and MCM payloads. The Fire Scout program will continue to support integration and testing for LCS-based mission modules.

The FY 2017 President's Budget requests $26.5 million of RDT&E,N to continue development of the MQ-8C endurance upgrade, to include integration of ISR payloads and radar, and studies for future payloads such as short range air to surface weapons and mine counter measures. Funding will also be used to continue payload and LCS/FF integration with the MQ-8B and MQ-8C. Procurement funding ($91 million) is requested for one MQ-8C air vehicle, one MQ-8 mission control system, ancillary, trainers and support equipment, technical support, modifications based on engineering changes and logistics products and support to outfit suitably-equipped air-capable ships and train the associated Aviation Detachments.

The Small Tactical Unmanned Aircraft System (STUAS) 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 and Marine Corps Forces Special Operations Command 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.

The FY 2017 President's Budget requests funding for four Navy systems to support Naval Special Warfare; and for four RQ-21A systems (which includes 20 air vehicles) to address

Marine Corps ISR capability requirements currently supported by service contracts. Blackjack entered LRIP in 2013, completed IOT&E in the second quarter of FY 2015, with Full Rate Production planned for the fourth quarter of FY 2016.

The FY 2017 President's Budget also requests in RDT&E,N funding for the continued development of the Common Control System (CCS). The primary mission of the CCS is to provide common control across the Navy's unmanned systems portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation, improve cost control, and enable rapid integration of unmanned systems capabilities across all domains: Air, Surface, Sub-Surface, and Ground. CCS uses an open and modular business model and is being developed as Government Furnished Information/Equipment for the RAQ-25 program and for follow-on use with Triton and Fire Scout.

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 ISR, Seabed Warfare, and Deception. AUVs and undersea fixed systems will operate in areas that are inaccessible to manned submarines and ships.

Dozens of AUVs are conducting sea sensing and mine countermeasure tasks today with human-in-the-loop supervision. Developmental work to expand AUV endurance, autonomy, and sensor/payload capability will eventually enable AUVs to operate for days or weeks with minimal human interaction needed to ensure successful task completion. While nominal force structure requirements for FY 2025 have not been determined, the Navy is committed to growing both the size and composition of the AUV force. In the near-term, AUVs present an opportunity to increase undersea superiority and offset the efforts of our adversaries.

The Large Displacement Unmanned Underwater Vehicle (LDUUV) is an unmanned undersea vehicle to offload "dull, dirty, dangerous" missions from manned platforms & mitigate the submarine gap beginning in 2022. LDUUV will be launched from a variety of platforms, including both surface ships and submarines. The craft's missions will include ISR, acoustic surveillance, ASW, MCM, and offensive operations.

The Surface Mine Countermeasure Unmanned Undersea Vehicle (SMCM UUV) commonly referred to as Knifefish employs a low frequency broadband synthetic aperture sonar.

Knifefish simultaneously detects volume and buried mines in high clutter environments. Knifefish is planned for incorporation into Increment 4 of the LCS MCM MP.