

NOT FOR PUBLICATION UNTIL RELEASED BY  
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

THE DEPARTMENT OF THE NAVY FISCAL YEAR 2021 BUDGET REQUEST FOR  
SEAPOWER AND PROJECTION FORCES

MARCH 4, 2020

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Chairman Courtney, Ranking Member Wittman and distinguished members of the Subcommittee, thank you for the opportunity to appear before you today to address the Department of Navy's Fiscal Year (FY) 2021 budget request. First, we would like to thank Congress and this Committee for your leadership and steadfast support of the Department of the Navy acquisition and research programs. Your efforts to fully fund the FY 2020 request for 12 ships helps to provide the stability and predictability in funding that will enable us to build the Navy the Nation Needs, the maritime component of the National Defense Strategy.

Dominant naval force and a strong maritime strategy are the primary engines of our National Defense Strategy. As we continue to face rapid change in the global security environment, including greater global trade and greater unpredictability, our national security posture must likewise change to adapt to the emerging security environment with a sense of urgency and innovation. This requires the right balance of readiness, capability and capacity as well as budget stability and predictability. It requires us to deliver relevant, effective, capability to our Sailors and Marines, and requires a constant focus on and partnership with the industrial base. They are a key element to our national security.

The character of war has changed, and so must our approach to developing the world's most lethal military force. We are no longer fighting against the great powers of the 19<sup>th</sup> and 20<sup>th</sup> centuries, and conflict is no longer limited to the domains of land, sea and air. The rapid pace of technological innovation means our adversaries have unprecedented access to new tools and technologies. To maintain overmatch means our Navy must maintain warfighting readiness to enable the operational reach, resilience and sustainment that will enable the best Naval forces in the world to operate forward where and when we choose. We are currently on year three of a transformational journey to increase readiness recovery, improve acquisition outcomes and deliver greater lethality, which has seen marked improvement in speed and scale of acquisition, maintenance avails, and recapitalization efforts. These



improvements are enabling the Department to better achieve our objectives of building a more lethal force with greater performance and affordability. We will continue to focus our efforts on four key priorities: deliver and sustain lethal capacity, increase agility, drive affordability, and develop the workforce.

### Deliver and Sustain Lethal Capacity

Since the start of FY 2019 we have delivered 10 relevant and capable ships to the Fleet including an *Arleigh Burke* class destroyer, a *Virginia* class submarine, five Littoral Combat Ships, two Expeditionary Fast Transport ships and one Expeditionary Sea Base. Today, the Navy has 79 ships under contract with 47 ships in construction. We expect to take delivery of 12 more ships in FY 2020, and plan to award an additional eight ships this year. The Marine Corps achieved Initial Operational Capability (IOC) on the Joint Light Tactical Vehicle

(JLTV) more than four months ahead of schedule, expediting the delivery of this key battlefield vehicle to the warfighter. On the aviation side we delivered over 125 new manned aircraft and 15 unmanned aircraft to Navy and Marine Corps units, improving capability and enabling the divestiture of less affordable and less capable legacy systems. Additionally, we achieved our goal of over 80 percent Mission Capable F/A-18 fleet by October 1, 2019. Efforts this year will focus on sustaining these advances.

Ship maintenance continues to be a priority focus area for the Department. We are grateful for the strong support we received from Congress as we work to leverage data analytics to provide better predictability and maintenance of our ships, and identify and close performance gaps. In particular, we appreciate your support for a pilot program for private contractor shipyard maintenance in the Pacific. This approach will improve our ability to



contract well in advance of an availability start, absorb ship schedule changes from operational demands, and address changes in availability scope. We began executing this authority in February, and our 2021 budget request continues to capitalize on this opportunity by extending the pilot. Predictable stable funding in this area is crucial to incentivize private yard growth.

To support our focus on sustainment, we established a Deputy Assistant Secretary (DASN) for Sustainment to develop, monitor and implement policy and guidance that will enable the Department to better plan, program, budget and execute our sustainment mission. DASN Sustainment will oversee and manage Navy and Marine Corps sustainment and life-cycle management policies, allowing the Department to improve and align the complex drivers of maintenance and modernization completion – that in turn will increase our output to the Fleet.

Navy-wide focus continues on making the USS *Gerald R Ford* ready for operational use. Going into 2020, CVN 78 will be deployed for 50 percent of the time certifying and testing systems and training the crew, while also being used for pilot generation, which is a critical need for carrier airwing readiness. We established a civilian and government team of experts to work with the shipbuilder to get *Ford*'s seven remaining Advanced Weapons Elevators (AWEs) completed prior to the end of the post deployment test and training phase. All 11 elevators will be completed by April 2021, which is the end of the current phase. The *Ford* will be the most capable aircraft carrier ever deployed and our Navy and Industry partners are focused on delivering this capability to the Fleet.

### **Increase Agility**

Delivering the right capabilities at the right time and sustaining our competitive advantage as a naval force requires an integrated, enterprise approach to business process improvement and modernization. We are moving beyond transactional ways of doing business and towards a fully integrated enterprise, linking our requirements and acquisition processes and integrating these processes with industry to become more agile, accountable and efficient. An example of a fully integrated effort is the Frigate program, where an interactive Conceptual Design process included a robust dialog with industry, which fed into the requirements documents and development of the RFP. We will be better able to compete and win by expanding that integration and continuing those efforts at scale and at speed.

We conducted our first Wartime Acquisition Support Plan (WASP) industry engagement with the leaders of traditional and non-traditional companies onboard the USS *Gerald R Ford*. This collaborative engagement allowed our acquisition workforce and program managers to gain valuable insights and recommendations on industry surge capabilities to support the Navy’s growing requirements. We will continue these regular industry engagements to build our response capability and ensure we are ready as a Navy to anticipate surge capacity in our industrial base and respond to any contingency.

In addition, we continue to take deliberate actions to challenge bureaucracy. In 2019, the Department cancelled 28 percent of our acquisition-related instructions and streamlined the remaining 72 percent. A thorough review of SECNAV 5000.2F – the primary instruction implementing the defense acquisition system – eliminated duplicative processes and resulted in a 65 percent reduction in page count. By removing the bureaucratic obstacles that slow innovation, we are becoming a more agile organization, better-focused on delivering mission requirements to the Fleet.

### FY 19 CONTRACTING STATS



- **\$121 BILLION OBLIGATED- A \$13 BILLION INCREASE**
- **128,348 NEW CONTRACTS**
- **246,161 TOTAL CONTRACT ACTIONS- A 18,110 DECREASE**
- **41% OF ACTIONS COMPETED**
- **156 OTA'S WORTH \$172.6 MILLION**
- **\$16 BILLION AWARDED DIRECTLY TO SMALL BUSINESS**
- **EXCEEDED SMALL BUSINESS GOALS BY 4%**

### Drive Affordability

Building and sustaining our Navy requires creative and aggressive contracting methods to achieve the right capability. The Department has achieved over \$25 billion in savings through the use of agile procurement and more advantageous contracting approaches. For example, we executed the two-carrier buy (CVN 80/81) contract with Huntington Ingalls Industries – which accounted for over \$4 billion in savings. We achieved additional savings through ship and aircraft Contractor Support Services reductions, process improvements, and Multi-Year Procurements for programs such as the DDG 51, *Virginia* class Submarines, V-22, and SM-6. Innovative contracting methods including block buys and smart negotiations supported a seven-fold increase in the number of Other Transaction Authority (OTA) contract awards, two times the number of active Cooperative R&D agreements, numerous

prize challenges, and multiple cases of using FY 2018 pricing to accelerate FY 2019 awards.

Last year the Department executed over \$121 billion in contracts, a 12 percent increase over obligations in the previous fiscal year, to approximately 20,000 industry partners. This work was awarded using 18,000 fewer contract actions – all while reducing the contract modification workload by more than 15 percent. Over 40 percent of the work was awarded through competition, while exceeding small business goals (18 percent actual vs. 14 percent goal) and awarding \$16 billion direct to small businesses.

### **Build a Workforce to Compete and Win**

A key aspect to increased lethality and readiness is the development of the workforce needed to compete and win. By focusing on our public shipyard and acquisition workforce, we were able to drive efficiencies in the system and better enable the execution of Department priorities. Navy shipyards increased their workforce by 40 percent in the last 10 years, transforming how they train new employees through the use of virtual and hands-on learning centers. The shipyards standardized and reduced regional variability in processes across the public shipyards, and developed “safe-to-fail” areas where artisans can experiment with new and innovative techniques to improve throughput. Through continued transformation efforts, the naval shipyards have successfully reduced the duration of training for an inexperienced worker, in some cases by as much as 50 percent.

For our acquisition professionals, the Department has issued a new Acquisition Workforce Strategic Plan establishing the vision for shaping the future acquisition workforce. We provided commercial online training to expand training opportunities, increased experiential learning through industry rotations, and conducted understanding industry courses at public universities for over 300 members of the acquisition workforce. The Navy is embarking on the development of a Talent Management System to capture and leverage a data-driven solution leveraging commercial best practices for the Acquisition Workforce to develop, retain, and reward people to meet current and future organizational needs. These efforts help ensure we have the right people, with the right skill set to deliver critical capabilities to the Fleet. We focused our Acquisition Workforce Funding to attract talent that will infuse the civilian workforce targeting critical skill gaps such as STEM and Information Technology. The Navy also leveraged Section 1111 hiring authorities to hire high quality acquisition and technology experts with a focus on Supply Chain and Sustainment challenges.

## **The Fiscal Year 2021 President's Budget Request**

The President's FY 2021 budget builds on these initiatives in order to provide the best-balanced force in support of the National Defense Strategy, enabling us to deliver the people, the platforms, and the capabilities necessary to protect American interests around the world. The budget builds on prior investments while making the adjustments necessary to deliver greater efficiency and effectiveness.

The FY 2021 request continues key investments in advanced technologies and modernization of our current Seapower and Projection forces, prioritizing the recapitalization of the strategic ballistic missile submarine, the *Columbia* class, which remains the Navy's highest acquisition priority. A healthy industrial base critical to meeting this demand, and the Department greatly appreciates strong congressional support for our nation's vital shipbuilding program and industrial base expansion. The FY 2021 budget supports the sustainment of our readiness recovery to deliver credible ready forces now, and the aggressive pursuit of increased lethality and modernization with the greatest potential to deliver non-linear warfighting advantages. This includes the prioritization of force design and the delivery of Naval Expeditionary forces capable of imposing cost with distributed, lethal power, and the delivery of capable capacity within the constraints of our available resources.

Given the budget topline constraints, the FY 2021 budget prioritizes a more capable and lethal force over a larger force that would be less capable, less ready and less lethal. It includes procurement of 44 battle force ships within the Future Years Defense Program (FYDP), and shows a realistic approach to planning the future force within projected budgets. The plan remains mindful of the need to keep the shipbuilding industrial base loaded at an effective level that encourages industry investment in capital improvements, capital expansion, and a properly sized world-class workforce.

Sustaining that force structure through the maintenance and modernization will be the key to ensuring those assets can meet operational demands over their design service lives. The Navy continues to execute a number of initiatives that will facilitate a more adaptable and reliable industrial base for ship repair, while providing a foundation to support the workload forecasts of our industry partners. These include improvement in processes to plan and schedule the right work; more realistic assessments of the cost and duration of work; awarding contracts earlier; making more efficient use of existing industrial facilities and drydocks, and preparing for the future by investing in industrial equipment and personnel

training to promote a healthy industrial base. Continued implementation of these essential steps will reduce the maintenance backlog affecting our ships today, and to enable sustainment of the Naval Fleet of the future.

## **Summary**

Thank you for the strong support this Subcommittee has always provided to our Sailors and Marines. The Department of the Navy continues to instill affordability, stability, and capacity into our programs in order to deliver capability to our warfighters faster and be as effective as possible within our resources. With Congress' support, we can ensure the Department's strategic deterrence, readiness, lethality and capacity will continue to deliver superior naval power around the world both today and tomorrow.

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

## **U.S. NAVY AND MARINE CORPS SEAPOWER CAPABILITIES**

### **Ships**

#### **Submarines**

Ballistic Missile Submarines, coupled with the TRIDENT II D-5 Strategic Weapons System, represent the most survivable leg of the Nation's strategic arsenal and provide the Nation's most assured nuclear response capability. As such, the *Columbia* class program remains the Navy's number one acquisition priority program and is on track to start construction in October 2020 and deliver to pace the retirement of our current ballistic missile submarines, deploying for its first patrol in FY 2031.

The FY 2021 President's Budget supports the funding required to begin lead ship construction and continue lead ship design and advance construction activities with a plan to achieve a target of 83 percent design completion at construction start, as compared to the 43 percent at start of *Virginia* class. General Dynamics Electric Boat and Huntington Ingalls Industries-Newport News will procure component and commodity material based upon construction start and supplier lead times in order to support lead ship construction start in October 2020. The FY 2021 President's Budget request also funds Continuous Production of Missile Tubes to support procurement of Common Missile Compartment material for the U.K.



Dreadnought class submarines being executed under the Polaris Sales Agreement. The award was coordinated with the *Virginia* class program to maximize efficiencies across the procurement of all large diameter tubes. Also included in the FY 2021 budget are many development efforts to make submarines more capable.

The Navy will build on past success with the FY 2020 award of the Block V multi-year procurement (MYP) contract for the construction of nine ships, with options for additional ships. Starting with the second ship, these submarines will introduce the *Virginia* Payload Module and all Block V ships will have Acoustic Superiority.

The Navy, the shipbuilders and related suppliers recognize that vigilance in the execution and oversight of the *Virginia* and *Columbia* programs is critical. In FY 2020 the Navy will use the \$123 million provided for industrial base support to align shipbuilder-procured material procurements with *Columbia* class funding with funds budgeted for *Virginia* class and CVN for common components and vendors. Additionally, the Navy is implementing Continuous Production on selected shipyard-manufactured items to reduce cost and schedule risk, and help strengthen the industrial base with a focus on critical vendors. Advance Construction activities began June 2019 at General Dynamics Electric Boat and Huntington Ingalls Industries-Newport News to proactively manage schedule margin and reduce controlling path risks for *Columbia*.

### **Aircraft Carriers**

CVN 78 completed Post Shakedown Availability (PSA)/Selected Restricted Availability in October 2019, culminating with a highly successful sea trial. During the PSA, the Navy and our industrial partners completed production and certified four AWEs, repaired the ship's propulsion system, completed upgrades to the Advanced Arresting Gear (AAG) and corrected over 96 percent of the sea trial discrepancies. The ship is now in an 18-month Post Delivery Test and Trials (PDT&T) phase where the crew certifies the fuel systems, conducts aircraft compatibility testing, exercises the flight deck, and tests the combat systems. We will also complete production and certification of the remaining seven AWEs during PDT&T. The Navy continues to see progress in the testing of new systems aboard USS *Gerald R Ford* (CVN 78). AWEs have been cycled over 5,400 times, including 1,500 at sea, and are performing as designed. CVN 78 successfully completed Aircraft Compatibility Testing (ACT), with over 200 launches and recoveries of different type/model/series aircraft

during its at-sea period in January. Successful completion of ACT is an important milestone towards achieving Flight Deck Certification expected in March 2020. The ship is expected to conduct several thousand launches and recoveries between now and completion of PDT&T. Readyng USS *Gerald R Ford* for deployment is a Navy priority and the Department is working collectively with the Navy shipbuilding industry to transition CVN 78 into Fleet operations. The *John F Kennedy* (CVN 79) was christened on December 7, 2019, launched two-months early on December 16, 2019, and is 68 percent construction complete. When compared to CVN 78, CVN 79 is performing at a 16 percent man-hour stepdown. CVN 80 construction is three percent complete by construction man-hours and CVN 81 has commenced material procurement. Additionally, CVN 80 is on schedule to meet its first major construction milestone, keel laying, in the second quarter of FY 2022.

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. The RCOH is refueling the ship's reactors, modernizing its capabilities, and repairing ship systems and infrastructure. CVN 73 successfully undocked in September 2019 and the RCOH is 68 percent complete with re-delivery planned for December 2021. CVN 74 RCOH advance planning efforts remain on track to commence RCOH in January 2021. CVN 75 will begin RCOH in FY 2025.

### **Large Surface Combatants**

The *Arleigh Burke* class (DDG 51) program remains one of the Navy's most successful shipbuilding programs with 67 ships delivered to the Fleet. The FY 2018-2022 MYP maximizes affordability and stabilizes the industrial base. These Flight III ships will provide enhanced Integrated Air and Missile Defense with the AN/SPY 6(V)1 Air and Missile Defense Radar (AMDR) and AEGIS Baseline 10. AMDR meets the growing ballistic missile threat by improving radar sensitivity and enabling longer range detection of increasingly complex threats. The program demonstrated design maturity through its successful completion of all developmental testing. AMDR is in production and on schedule for delivery with the first Flight III ships. The 2021 President's Budget requests funding for the procurement of two ships of the MYP contract. The \$520 million increase in FY 2020 Advanced Procurement funding will be used to procure Long Lead Time Material for FY 2021 Flight III ships and to bolster the surface combatant supplier base.

Complementing the DDG 51, the DDG 1000 *Zumwalt* class guided missile destroyers provide multi-mission surface combatants designed to provide long-range, offensive surface strike capabilities. The DDG 1000 ship is on track for final delivery at the end of March followed by continued testing and a PSA in support of achieving Initial Operational Capability (IOC) by September of 2021. DDG 1001 commissioned on January 26, 2019, is currently undergoing combat system installation and is expected to complete in July of 2020 following further combat system activation and test. Construction on DDG 1002 is over 87 percent complete at General Dynamics Bath Iron Works with HM&E delivery planned for December 2020.

In the FY 2021 budget request, the Navy has budgeted \$46 million of R&D funding for the Large Surface Combatant (LSC). As part of the Future Surface Combatant Force, LSC will fill all the roles and missions of a DDG-51 with additional capability and capacity critical to the future fight. LSC will enable the ability to launch large missiles with extended ranges, and provide a new hull form and electrical/propulsion plant for increased efficiency and survivability, while reestablishing service life allowances for future growth to pace the threat. The LSC will reduce combat system development risk by utilizing mature technologies that leverage the DDG 51 FLT III Navy standard program of record combat system elements and reduce engineering system development risk by land based testing of the propulsion and electrical system integration prior to detail design. FY 2021 funds will be used for the maturation of requirements analysis to draft a Capabilities Development Document, develop a new LSC land-based technology development plan, and initiate a collaborative government and industry effort necessary to develop the LSC preliminary design.

The Navy partnership with industry will include both design and shipbuilding contributors driving to a stable requirements baseline, and a ship that will have been designed for producibility as well as flexibility.

### **Small Surface Combatants**

Reemergence of a Great Power Competition and the pivot to the Indo-Pacific requires a more capable Small Surface Combatant for operations in contested environments. FFG(X) is the evolution of a ship design with increased lethality, survivability, and improved capability to support the National Defense Strategy across the full range of military operations as part of a more lethal Joint Force. FFG(X) Capability Requirements are mature and reflect the needs to

support the National Defense Strategy's "Blunt" and "Contact" layers to deny adversary aggression and manage conflict escalation in our global operating model. Existing Fleet requirements and detailed analysis have been refined through early engagement with industry in a collaborative Conceptual Design process that completed in June 2019. The FFG(X) program is managing development risk by combining proven ship designs with mature, best-of-breed Government Furnished Equipment designated combat system elements. The Navy is confident in the capability FFG(X) will deliver to the Fleet. FFG(X) is in a full and open competition source selection for the Detail Design and Construction Contract, which ensures competitive pricing and drives best value capability. Contract award is expected by the end of FY 2020. The FY 2021 budget procures the second ship of the class and continues RDT&E efforts to deliver critical warfighting capability to the Fleet on time. This supports the steady profile growth of the program, which will see increased annual procurement starting in FY 2023.

The Littoral Combat Ship (LCS) program has delivered 21 of the 35 total planned ships. The program plan for these ships is: four dedicated test ships; eight Surface Warfare (SUW) ships; eight Anti-Submarine Warfare (ASW) ships; and 15 Mine Countermeasure ships. The initial four ships designated as test assets will complete testing and decommission by the end of FY 2021. The Navy is beginning to backfit an Over the Horizon Weapon System (OTH WS) on all LCSs for increased lethality. The award in May 2018 of the Naval Strike Missile contract for OTH WS brings a technologically mature weapons system and extends the offensive capability of the ship. Starting with the deployment of USS Montgomery (LCS 8) in June 2019, a total of nine LCS will have completed their inaugural deployments to 7<sup>th</sup>, 5<sup>th</sup> or 4<sup>th</sup> Fleet by the end of FY 2021, providing a significant increase in contact layer assets for Fleet Commanders which will continue to grow as the remaining ships are delivered to the Fleet.

### **Amphibious Ships**

Amphibious warfare ships are a cornerstone of the Nation's global forward presence. They continue to play a pivotal role in responding to world crisis and supporting a broad range of missions across the spectrum of conflict. Today, these ships are persistently forward deployed, competing below the level of armed conflict while living within the range of enemy fires, building partner capacity, and deterring enemy aggression. Partnered with industry we

are committed to delivering the most capable multi-mission amphibious warfare ship on the planet.

*America* class (LHA 6) will replace the decommissioning LHA 1 *Tarawa* and aging LHD 1 *Wasp* class ships. USS *America* (LHA 6) recently deployed as the centerpiece of the *America* Amphibious Readiness Group/Marine Expeditionary Unit with the F 35B operating from the flight deck. USS *Tripoli* (LHA 7) delivered on February 28, 2020. The ship will focus on moving the crew aboard and prepare for commissioning and sailaway later this year. Fabrication has begun on LHA 8, with 26 units erected that will support a FY 2024 delivery. LHA 8 will include a well deck to increase operational flexibility and includes a reduced island structure that increases flight deck space to enhance aviation capability. All LHAs will be F-35B capable.

*San Antonio* class (LPD 17) provides the ability to embark, transport, and land elements of a landing force by helicopters, tilt rotor aircraft, landing craft, and amphibious vehicles. The LPD 28 is 65 percent complete and planned for delivery in September 2021, while the LPD 29 is 25 percent complete and planned for delivery in the fourth quarter of FY 2023. LPD 28 and LPD 29 leveraged many design innovations and cost reduction initiatives, including the first install of the Enterprise Air Surveillance Radar (EASR) on LPD 29, as the class transitions to Flight II, integrating more high-level capabilities. The Navy awarded the first Flight II ship, LPD 30, in March of 2019 with a planned delivery in the second quarter of FY 2025. Additionally, the Navy intends to place LPD 31 on contract by fall of 2020. The future amphibious force structure and composition are being evaluated as part of the larger ongoing Integrated Naval Force Structure Assessment.

### **Light Amphibious Warships**

In support of tasks within the range of military operations, which includes Littoral Operations in a Contested Environment (LOCE) and Expeditionary Advanced Base Operations (EABO), the Navy will commence with Concept Studies to evaluate the next generation medium lift intra-theater amphibious platforms and logistics ships. These studies will primarily focus on commercial designs tailored for military application to enable maneuver, mobility and naval sustainment (Refuel, Resupply, and Rearming) for our integrated naval forces conducting distributed maritime operations.

## **Connectors**

The Ship to Shore Connector (SSC) program provides the capability to rapidly project assault forces within the littoral operational environment to accomplish Unified Campaign Plan missions and ensures the Joint Force Commander's ability to conduct amphibious operations maneuvering over-the-beach, over ice, mud, rivers, swamps and marshes. The Landing Craft, Air Cushion (LCAC) 100 class craft are the functional replacement for the legacy LCAC craft, which began reaching end of their service life extensions 2015. The Department remains committed to maintaining this critical non-displacement craft capability with the LCAC extended SLEP (E-SLEP) initiative and the SSC program despite its recent developmental setbacks and commensurate reductions in procurement quantities quantities in FY 2020 and FY 2021. The Navy continues to work with our industry partners on a joint technical assessment to remediate issues discovered in the September 2019 Builders Trials. The FY 2021 budget request reallocates funding from the SSC program to E-SLEP to improve and upgrade these versatile platforms, and ensure the connection between the combat power and logistics sustainment of the sea bases to the expeditionary forces. The Navy is also replacing its aging Landing Craft Utility fleet in the LCU 1700 program which will restore LCU's complementary heavy lift payload in a more rugged, reliable, and affordable independent operations capable non-displacement platform.

## **Auxiliary Ships, Expeditionary, and Other Vessels**

Expeditionary support vessels are highly flexible platforms that are used across a broad range of military operations supporting multiple operational phases. The Expeditionary Sea Base (ESB) is part of the critical access infrastructure that supports the deployment of forces and supplies to provide prepositioned equipment and sustainment with flexible distribution. The Navy took delivery of the USNS Miguel Keith (ESB 5) in November 2019. The ESB 6 and ESB 7 Fixed Price Incentive contract was awarded in August 2019 with planned deliveries in FY 2022 and FY 2023. The Expeditionary Fast Transport (EPF) program provides high speed, shallow draft transportation capability to support the intra-theater maneuver of personnel, supplies and equipment for the Navy, Marine Corps, and Army. EPF 11 delivered in December 2019. EPF 12 and EPF 13 are under construction with deliveries planned in FY 2020 and FY 2021, and EPF 13 and EPF 14 awarded in March 2019. An enhanced medical capability in support of Distributed Maritime Operations is planned for EPF 14.

The Combat Logistics Force (CLF) consists of T-AOE fast combat support ships, T-AKE dry cargo and ammunition ships, and T-AO fleet replenishment oilers. CLF 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 at sea. The *Kaiser* class (T-AO 187) fleet replenishment oilers will be replaced with the *John Lewis* class fleet replenishment oilers, designated T-AO 205 class. T-AO 205 is 76 percent complete and planned for delivery in June of 2021. The two follow-on ships of the class, are 32 and 19 percent complete, respectively.

The Department began construction this fall on the *Navajo*, a combined towing, salvage, and rescue (T-ATS) ship. T-ATS is based on existing commercial towing offshore support vessel design, and will provide ocean-going tug, salvage, and rescue capabilities to support Fleet operations. The Navy will exercise contract options for the two FY 2020 ships later this year, and the FY 2021 budget request increases T-ATS procurement for a total of two ships.

### **Strategic Sealift**

The Navy has begun the first steps in executing its sealift recapitalization plan called *Sealift that the Nation Needs*. This three-phased approach includes the Service Life Extensions of select Surge Sealift vessels, acquiring used vessels, and a new construction shipbuilding program. The Navy's long-term strategy recommends assigning new construction common hull vessels to the Maritime Prepositioning Force (MPF) as delivered, ensuring the Fleet has the latest capabilities to support employment across the full range of military operations. Existing MPF ships would rotate to surge, preserving capability and maintaining the requisite square footage to meet USTRANSCOM sealift capacity requirements. The FY 2021 budget request increases resources for operations and sustainment to improve current readiness, maintains service life extensions, increases used vessel acquisition for a total of two in FY 2021, and maintains investments for new construction sealift industry studies and preliminary design of the flagship T-AKR(X) Strategic Sealift vessel.

### **Sustainment, Modernization and Service Life Extensions**

The Navy has undertaken a multipronged approach focused on increasing accountability and improving productivity in both public and private shipyards. In our public

yards, the Navy is growing the capacity of the shipyards to meet the workload demand, improving the training and productivity of the workforce, and making the needed investments in our shipyards to ensure they can support our growing needs. In the private shipyards, the Navy has focused on improving the completeness, accuracy, and timeliness of planning; working with the Fleet to adjust maintenance schedules to level load the ports, revising acquisition strategies to improve stability and predictability, and streamlining Navy inspection points to improve efficiencies.

The fiscal realities facing the Navy make it imperative to maintain our in-service ships to achieve their expected service lives and maintain their relevant combat systems through modernization efforts. The FY 2021 President's Budget includes funding for the modernization of three destroyers to sustain combat effectiveness, ensure mission relevancy, and achieve the full expected service lives of the AEGIS Fleet. Service life extensions can be targeted, physical changes to specific hulls to gain a few more years, or a class-wide extension based on engineering analysis. The Navy has evaluated the most effective balance between costs and capability to be removing the service life extension on the DDG 51 class; extending the services life of the most capable ships in the cruiser fleet while removing the four cruisers that have the least effective ballistic missile capability; and delaying the accelerated retirement plan for the mine countermeasure ships by one year.

### **Shipyard Infrastructure Optimization Plan (SIOP)**

Maintaining and improving public and private ship repair infrastructure capacity is essential to conducting required maintenance of a growing Navy. Planned Naval Shipyard investments and completion of Naval Shipyard optimization analysis are a necessary step to improve public shipyard productivity and performance. The Navy is outlining a strategy for the optimal placement of facilities and major equipment at each public shipyard, including a 20-year investment plan for infrastructure to ensure we can continue to support the world's finest naval force now and into the future. The plan focuses on three major areas for each of the Navy's four public shipyards: dry dock recapitalization; facility layout and optimization; and capital equipment modernization.

Phase II of the SIOP is well underway with the development of the shipyard digital twins, the commencement of requisite facility engineering studies and the environmental planning activities at Pearl Harbor Naval Shipyard. The Area Development Plans (ADP) for



the four public shipyards are scheduled to be completed in FY 2022, with the program moving into the execution of the SIOP upon completion. Concurrent with the ADP effort, SIOP is moving forward with fact-of-life dry dock projects and other facility and capital equipment investments required in meeting the demands of the Navy's Fleet Commanders. The SIOP is also rapidly developing a first-of-its-kind Dry Dock Production Facility for Pearl Harbor to demonstrate the efficiencies that will be gained by moving the work closer to the ship in a state-of-the-art industrial facility. These efforts represent a substantial capital investment to ensure that America's shipyards will continue to keep our Navy in peak fighting condition for decades to come.

### **Unmanned Surface and Undersea Vehicles**

Unmanned systems continue to advance in development and will be key enablers through all phases of warfare and in all warfare domains. The Navy is using a Family of Systems strategy to develop and employ unmanned surface and undersea capabilities that augment and relieve stress on the manned force, and increase the cost imposed on our competitors.

This year in the surface domain the Navy will commence low-rate production of a modular Mine Countermeasures Unmanned Surface Vehicle; award a contract for the first prototype medium unmanned surface vehicle (MUSV) to provide distributed sensing capacity to the surface force; continue evaluation of the Marine Corps' long range unmanned surface vessel (LRUSV); and award large unmanned surface vessel (LUSV) conceptual design contracts while continuing to mature and demonstrate the necessary technologies leading to a unmanned capability to provide distributed lethality as a part of the Future Surface Combatant Force. Additionally, the Navy will award a Multi Award Contract Indefinite Delivery/Indefinite Quantity to provide the key enabling technologies for the unmanned surface Family of Systems.

In the undersea domain, the Navy has commenced fabrication of Orca Extra Large Unmanned Undersea Vehicle (XLUUV). Competitive RFPs will be issued in FY 2020 for initial production of Snakehead, the Large Displacement UUV, and for production of a Medium UUV that supports both the submarine launched Razorback environmental sensing mission, as well as the Maritime Expeditionary Mine Countermeasures UUVs mission.

In support of these new capabilities, the Navy is also investing in enabling

technologies, such as autonomy, command and control, energy, and payloads, as well as establishing the interoperable standards and open architectures for ease of technology transition. These technologies and standards are the foundation necessary to ensure integration and transition to the fleet using a disciplined approach.

The Navy has undertaken an aggressive approach through competitive prototyping in collaboration with industry to accelerate these new technologies utilizing the new authorities granted by Congress over the past few years, such as middle-tier acquisitions and acquisition agility legislation. This affords the Navy the ability to prudently prototype, experiment, and demonstrate new capabilities prior to commencing with Programs of Record. Unmanned vessels are key elements in the future naval force and the Navy fully intends to leverage the progress to inform new concepts of operation, new means of integrating unmanned and manned vessels, and new capabilities afforded by these advances.

### **Combat Systems**

The Department continues to field the most capable and lethal surface and submarine combat systems in the world. AEGIS combat system capability continually evolves to deliver additional warfighter improvements to the AEGIS Fleet. AEGIS Combat System Baseline 9 delivers unprecedented offensive and defensive capabilities, including offensive strike and ASW, and simultaneous air and ballistic missile defense on destroyers and Air Defense Commander capability on cruisers. AEGIS Baseline 10 will incorporate the AN/SPY 6(V)1 Air and Missile Defense Radar (AMDR) for DDG 51 FLT III ships providing significant performance improvements over the AN/SPY 1D(V) radar and expanding the sensor coverage and enhancing the Navy's ability to perform the Integrated Air and Missile Defense mission.

Utilizing open architecture that takes full advantage of evolving technology to rapidly deliver real-time, reliable, and actionable information to the warfighter, the Department continues working towards breaking the paradigm of hardware-software dependent deliveries. Using virtualization technology, the AEGIS virtual twin system, a prototype of the AEGIS Virtual Combat Management System, is able to run AEGIS Weapon System code in a fraction of the original hardware space. The AEGIS virtual twin successfully executed its first live-fire engagement this past year. Additionally, the Navy successfully tested the Virtual Laboratory on Ship (VLOS), a virtualized Undersea Warfare Combat System (AN/SQQ-89 A(V)15), during a weeklong underway period. VLOS represents another important step forward in the

Navy's efforts to speed combat system element development and software upgrades.

The Department continues to aggressively pursue affordable systems that are employable from multiple platforms. Leveraging the investment in AMDR, scaled variants of the AN/SPY-6(V) are planned to replace the AN/SPY-1 radar on select existing DDG 51 FLT IIA ships to become the primary Air Search Radar for carriers, amphibious ships and the guided missile frigate (i.e. EASR). The use of a common core technology and support strategy enables significant life cycle efficiencies in maintenance support, training, and overall cost for the Navy's primary surface ship radars.

The Navy continued to equip its submarines with the ever-evolving undersea combat system utilizing bi-annual hardware Technology Insertions on even years and software Advanced Processing Builds on odd years. This process leverages commercial off-the-shelf (COTS) technologies via the Acoustic Rapid COTS Insertion program mitigating COTS obsolescence while providing more capability improvement at lower costs.

## **Weapons**

### **Missile Programs**

SM-6 missiles provide theater and high value target area defense for the Fleet, and with Integrated Fire Control, has more than doubled its range in the counter-air mission. SM-6 Block I declared Full Operational Capability in December 2017 and SM-6 Block IA successfully achieved IOC in October 2019. The Navy awarded a five-year MYP contract for up to 625 SM-6 missiles in December 2019. The FY 2021 President's budget continues funding for the upgraded SM-2 Block IIC and the SM-6 Block IB missiles as rapid prototyping pathway middle tier acquisition projects. SM-2 Block IIC leverages investments made in SM-6 Block I and Evolved Sea Sparrow Missile (ESSM) Block II to enhance performance against numerous threats and to increase depth of fire. The SM-6 Block IB seeks to provide an extended range capability in response to Joint, Fleet and Navy Urgent Operational Needs by integrating a new government developed rocket motor onto an existing SM-6 Block 1A seeker.

ESSM provides another layer to the Navy's defensive battle-space. ESSM Block 2 is on track to achieve IOC for AEGIS platforms in FY 2020 and Ship Self-Defense System platforms in the 2022-2023 timeframe.

The inner layer of the Fleet's layered defense is the Rolling Airframe Missile (RAM)

designed to pace the evolving anti-ship cruise missile threat and improve performance against complex engagement scenarios.

### **Offensive Missile Strategy**

The Navy's offensive strike systems consist of a broad family of current and future weapons that together can and will strike from the sea, air, and land. These weapons capitalize on key system attributes (e.g. speed, range, lethality, survivability, and commonality) with a strong focus on delivering 'multi-domain' capabilities. The Department's Offensive Missile Strategy (OMS) supports a wider, more systematic approach towards delivering offensive weapons balance to increase overall force effectiveness to address emerging threats.

Our current OMS construct has three pillars. First, the Department will sustain relevant weapon systems. Our objective is to preserve the readiness and capacity of our key strike weapons inventories. Second, the Department will pursue strike weapon capability enhancements. Under this initiative, the Navy will develop near-term capability upgrades to enhance existing weapons that provide critical improvements to our current long-range strike weapons capabilities (e.g. Maritime Strike Tomahawk (MST), LRASM V1.1, SM-6/Block 1B, and the Naval Strike Missile). Third, the Department will develop next-generation strike missile capabilities to address emerging threats.

The OMS is reviewed annually based on current capabilities and emerging threats, and updated to leverage analytical processes/study updates. The results are used to inform annual RDT&E and procurement funding priorities to achieve an optimal mix of offensive strike missile system capabilities. The 2020 OMS is currently being finalized and is a classified document. Additional details about next generation weapons development can be provided in a classified setting.

### **Directed Energy**

In FY 2020, the Navy provided Congress its path forward for shipboard integration of High Energy Laser (HEL) systems and the risk reduction plan to continue to improve technology while growing the industrial base for these systems. Initial capabilities, such as Solid State Laser – Technology Maturation (SSL-TM) on USS *Portland* (LPD-27), have been fielded for shipboard experimentation and integration. This type of operational experimentation is valuable for the Navy's long term consideration of other ship classes as host platforms for

laser weapons. In the FY 2021 budget request, the Department will continue advancing capabilities of laser weapons to meet ship defense missions. The Department is also collaborating and partnering with OSD and other Services to mature these advance technologies to defeat more challenging threats and shape future acquisition of these systems.

### **Manned Naval Aviation**

With the support of Congress, the Navy and Marine Corps continue to implement our “Vision for Naval Aviation 2025”. This framework informs our Naval Aviation investment priorities across the triad of warfighting capability, capacity, and strategic wholeness; placing the right capability in the hands of the warfighter in the most affordable manner possible.

#### **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 aircraft. The E-2D AHE provides Theater Air and Missile Defense capabilities and is a cornerstone of the Naval Integrated Fire Control system of systems enhancements.

This year the program will take delivery of five aircraft. In the third year of a 26 aircraft MYP contract (FY 2019-2023), the FY 2021 budget requests \$749.3 million in APN for four aircraft and Advance Procurement for FY 2022 aircraft. The FY 2021 budget also requests \$309.4 million in RDT&E to continue development, integration, and test efforts to outpace the evolving threat. Modernization priorities include Naval Integrated Fire Control development and test, Theater Combat ID and National Technical Means integration, ALQ-217 Electronic Support Measures and Survivability updates, Cyber Protection, Counter Electronic Attack, Secret Internet Protocol Router chat, Crypto Modernization/ Frequency Remapping, Multifunctional Information Distribution System/Joint Tactical Radio System Tactical Targeting Network Technology, Sensor Netting, Data Fusion, and Hawkeye Cockpit Technical Refresh.

#### **Maritime Patrol Aircraft**

The P-8A Poseidon combines the proven reliability of commercial 737 airframes with modern avionics, military communications, and advanced sensors and weapons to provide a

range of advanced warfighting capabilities. P-8A capabilities include full-spectrum, wide area, cue-to-kill Anti-Submarine Warfare; Anti-Surface Warfare; and networked Intelligence, Surveillance, and Reconnaissance (ISR). Continued congressional support enables the P-8A program to complete the replacement of the legacy P-3C Orions. P-8A squadrons now deploy continuously to all areas of the globe.

The warfighting requirement is 138 aircraft, including US Naval Reserve squadrons and quick reaction capable aircraft, with 120 aircraft funded. Boeing intends to initiate P-8A production line shutdown activities in FY 2021 if no additional P-8A orders are received. As of January 2020, 91 US aircraft have been delivered. The final production lot contract award is projected for FY 2020.

P-8A has three increments; Increments 1, 2 and part of 3 are fielded. The final Increment 3 modifications, Engineering Change Proposal (ECP) 6 and 7, will provide new system architecture and updates to include the addition of Networked Enabled Weapons capabilities, satellite communication updates, track management enhancements, sensor fusion capabilities, and Multi-Static Active Coherent Enhancements. ECP 6 successfully completed Critical Design Review in December 2019, will begin test aircraft integration in FY 2020-2021, and support developmental and operational testing in FYs 2022-2024. ECP 7 is the software improvement, being executed concurrently with ECP 6, that completed Critical Design Review in 2018 and is scheduled to commence P-8A integration in FY 2021 and IOC in FY 2025. The FY 2021 request includes \$207.3 million in RDT&E for integration of ECP 6 and ECP 7 to complete baseline capability fielding, and rapid development efforts for evolving threats, and \$260.6 million in APN for fleet modification kits, deficiency corrections, safety upgrades, and production line shutdown activities.

### **KC-130J**

The KC-130J remains a force multiplier for deployed Marine Air-Ground Task Force (MAGTF) success, bringing increased capability, performance, and survivability with lower operating and sustainment costs. The KC-130J is in high demand as it provides tactical air-to-air refueling, assault support, close air support and Multi-sensor Imagery Reconnaissance capabilities in support of Special Purpose MAGTFs and deployed Marine Expeditionary Units. The FY 2021 budget requests \$448.0 million in APN to procure five KC-130Js through the USAF MYP contract, and \$120.2 million in APN for targeted improvements including

increased survivability through advanced electronic countermeasure modernization, Link-16 digital interoperability, and obsolescence upgrades for Harvest HAWK ISR/Weapon Mission Kit and Hellfire variant compatibility and improved full motion video data-link.

### **Tilt-Rotor Aircraft (USMC MV-22 Osprey and Navy CMV-22B)**

Marine Corps MV-22 Ospreys currently have a permanent presence in INDOPACOM, CENTCOM, and EUCOM, and supporting crisis response missions for AFRICOM. In December 2019, Special Purpose MAGTF rapidly responded with additional security at the U.S. Embassy in Baghdad, Iraq using the unique speed and range of the MV-22. The Marine Corps plans to procure 20 additional aircraft through the MYP (FY 2018-2022). The MV-22 readiness program, comprised of Common Configuration-Readiness and Modernization (CC-RAM) and nacelle improvements, is the MV-22 community's optimized plan to increase mission capable rates by 15 percent. The FY 2021 budget requests \$90.3 million in RDT&E for continued MV-22B development and product improvements; \$341.6 million in APN for 3 MV-22s and long-lead materials; and \$312.8 million for modifications, of which \$168.3 million is for CC-RAM.

The Navy is continuing development of Carrier On-board Delivery (COD) mission aircraft, leveraging MV-22 investment to recapitalize the legacy C-2 fleet with CMV-22B tilt-rotor aircraft. CMV-22B's first flight occurred in December 2019 and the aircraft transitioned into developmental test in January 2020. The FY 2021 budget requests \$42.3 million in RDT&E for continued development, testing, and product improvements; \$632.7 million in APN for six CMV-22Bs and long-lead materials; and \$23.2 million for readiness and interoperability improvements.

### **CH-53K Heavy Lift Replacement Program**

The CH-53K remains the only fully marinized, heavy-lift rotorcraft capable of supporting current and future warfighting concepts for the naval force. In the past year, CH-53K has executed a Government/Industry Joint Program Plan, demonstrating significant progress in executing development and flight test activities. Notably, the most significant technical challenge of Exhaust Gas Re-ingestion and associated engine integration issues has been resolved, and demonstrated in flight test in fall 2019. To date, the CH-53K has flown more than 1,680 flight test hours toward the completion of flight test and is currently 40

percent complete with development test in support of operational test. During FY 2021, the program will continue to execute developmental test flights including ship board operations, begin modifying system demonstration test article aircraft into the production configuration to support operational test, and perform initial pilot and crew training for operational test.

The FY 2021 President's Budget requests \$406.4 million in RDT&E to continue the CH-53K development and test, and \$1.0 billion in APN for procurement of seven low rate initial production aircraft, including advanced procurement and initial spares.

### **Unmanned Naval Aviation**

The Department has placed a priority on the development and fielding 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 the Navy integrates this technology within our total force structure.

#### **MQ-4C Triton**

The MQ-4C is a critical capability and capacity enabler in the Navy's Maritime ISR&T transition plan. Under this initiative, Triton fills a vital role for the Joint Forces Maritime Component Commander by delivering persistent and netted maritime ISR, and furthers our plan to retire legacy EP-3E aircraft as MQ-4Cs are delivered to the Fleet. FY 2021 investments reflect a production pause that allows for full programmatic focus on Multi-INT development to support delivery of previously procured air vehicles and control stations to achieve IOC in FY 2022.

The FY 2021 budget requests \$11.1 million in RDT&E to continue Triton baseline development activities, \$178.8 million in RDT&E for Multi-INT modernization, and \$163.6 million in APN for procurement of key elements of support costs. These support costs include trainer/training equipment, peculiar ground support equipment, government and contractor production team, interim contractor support for the Baseline Early Operational Capability, aircraft spares, and retrofit of one control station to the Multi-INT configuration.

#### **MQ-25 Carrier Based Unmanned Aerial System (UAS)**

The Navy remains fully committed to unmanned carrier aviation as an integral part of the future carrier air wing (CVW). Reflecting this commitment, MQ-25 is designated a



Maritime Accelerated Acquisition Program with a requirement to deliver the world's first carrier-based UAS no later than 2024, only six years after awarding the Engineering and Manufacturing Development contract. In keeping with this directive to deliver a mission critical capability to the Fleet as rapidly as possible, the MQ-25 program successfully completed the first test flight of the contractor-owned MQ-25 test asset on September 19, 2019, just 13 months after contract award. This testing provided early learning and discovery for major systems and software, allowing for adjustments significantly earlier in the development process than traditional acquisition programs. MQ-25's primary mission is a carrier-based tanker to extend the range, reach, and lethality of the CVW with its secondary mission as an ISR platform. MQ-25 tanker aircraft will be a force multiplier, reducing the use of F/A-18E/Fs for recovery and mission tanking and freeing these tactical aircraft to execute their primary strike fighter mission role, increasing strike fighter capacity within the CVW. A key MQ-25 enabler for CVW operations is the Unmanned Carrier Aviation Mission Control System (UMCS) and its associated infrastructure on shore and aboard carriers. The UMCS is required to command and control the MQ-25 air vehicle and payload.

The FY 2021 President's Budget requests \$266.97 million in RDT&E to complete the procurement of three system development test article aircraft under a fixed-cost contract, to continue development of the MQ-25 air system and UMCS, and \$60.9 million in OPN for installation of UMCS aboard aircraft carriers.

### **Counter Unmanned Aircraft Systems (C-UAS)**

The Navy continues implementation of integrated C-UAS solutions designed to protect high value and critical naval assets afloat and ashore as well as basic defensive measures at priority shore installations against the threats posed by unmanned aircraft systems. Our C-UAS efforts focus on maintaining commonality of current C-UAS solutions while rapidly evaluating, improving and implementing an integrated family of systems to meet evolving threats afloat and ashore. We are rapidly pursuing refinement of material solutions, threat-based mission assessments, development of advanced target discrimination and defeat capabilities while continuing installation, integration, improvement and sustainment of C-UAS capabilities at priority sites/installations and afloat platforms. We continue to engage with the Army as the designated C-UAS Executive Agent (EA) and provide support in standing up the C-UAS Joint Capabilities Office. Additionally, in partnership with the C-UAS EA, we plan to

refine an open architecture solution for common C2 system, as well as, identify or develop additional detect and deter capabilities to integrate into the C-UAS family of systems.

### **MAGTF Expeditionary UAS (MUX)**

The MAGTF Expeditionary UAS (MUX) will provide a competitive advantage to naval expeditionary forces operating in contested maritime and littoral spaces. The MUX family-of-systems will include land-based and sea-based platforms conducting scalable multi-functional Command, Control, Communications, Computers and ISR, Maritime Surveillance, Electronic Support, Electronic Attack, Airborne Early Warning, and Data Communications Relay. MUX is currently envisioned to be a modular land-based MALE-T platform and small-tactical platforms that are shipboard-compatible and runway-independent. The family of systems will provide a multi-mission, long-range, long-endurance platform that will complement MV-22 and F-35 operations in a contested maritime environment. The FY 2021 President's Budget requests \$22.6 million for research and development and prototyping requirements.

### **Marine Corps Ground Programs**

Fleet Marine Forces will support the naval and joint force by persisting as “stand-in forces” inside the range of adversary fires, sustaining contact with our allies and partners overseas, and competing below the level of armed conflict, but always ready for a peer fight. To do this, the Marine Corps will fight at sea, from the sea, and from the land to the sea and will continue to project multiple elements of power via air, ground, and surface capabilities. In partnership with the Navy and deployed in a variety of manners – on ships, connectors, aircraft, and on the ground – Fleet Marine Forces will deter enemy action and, if necessary, be prepared to defeat peer adversaries in contested environments.

### **Ground-Based Long-Range Precision Fires**

The Marine Corps' highest ground modernization priority, a Ground-Based Anti-Ship Missile (GBASM) capability, will provide anti-ship fires from land as part of an integrated Naval Anti-Surface Warfare campaign. This forward-deployed and survivable capability will enhance the lethality of our naval forces and will help to deny our adversaries the use of key maritime terrain.

The Marine Corps' GBASM solution is the Navy Marine Expeditionary Ship Interdiction System (NMESIS), consisting of an unmanned Joint Light Tactical Vehicle-based mobile launch platform, called the Remotely Operated Ground Unit for Expeditionary Fires (ROGUE-Fires), and Naval Strike Missiles (NSM). The NSM is identical to the Navy's Over the Horizon Weapon System deployed on the Littoral Combat Ship and will provide the Marine Corps with a missile capable of sea-skimming, high-g maneuverability, and the ability to engage targets from the side, rather than top-down. This maximizes lethality and missile survivability. Enhancements made to the High Mobility Artillery Rocket System and the development of the Ground Launched Cruise Missile will further strengthen the capabilities of the entire naval fires enterprise.

### **Combat and Tactical Vehicles**

The Ground Combat and Tactical Vehicle (GCTV) Strategy continues to provide a framework for portfolio management and enterprise decision support. The Marine Corps is investing approximately 32 percent of its modernization resources into GCTV systems within the FYDP. The overarching combat and tactical vehicle investment priority is the modernization of Assault Amphibian capability through the Amphibious Combat Vehicle (ACV) program as the means to replace the legacy Assault Amphibious Vehicle.

ACV will be a family of vehicles of various configurations, including personnel, command and control, recovery and 30-mm cannon variants. The ACV Family of Vehicles Acquisition Objective is now 1,122 vehicles. Live Fire Testing of production vehicles began in 2019, and Marines are currently being trained on the vehicle. The Department will conduct Initial Operational Test and Evaluation later this fiscal year with a Full Rate Production decision to follow. As of January 22, three lots of Low Rate Initial Production totaling 90 vehicles have been awarded to BAE Systems. The program office continues to work with BAE on production ramp up. Full Rate Production contract award is anticipated in early FY 2021, with production reaching 120 vehicles per year delivered to the Marine Corps in the out-years of the budget.

### **Command and Control for a Degraded Environment**

Command and control in a degraded environment requires a layered approach with the ability to adapt to changing electromagnetic environments beyond the line of sight. This

layered network approach, coupled with a command philosophy that allows commanders at all echelons the freedom to make decisions while operating within their higher commander's intent, provides a resilient, dynamic C2 structure that harnesses new and emerging technology to support decision superiority.

G/ATOR is a state-of-the-art, ground-based, short-to-medium range, expeditionary radar system designed as a single materiel solution to satisfy air surveillance, air defense, ground counter-fire and counter-battery, and potentially air traffic control mission requirements. Block I achieved Initial Operational Capability in February 2018 and Block II did so in March 2019. Full Operational Capability will be achieved in fiscal year 2025. G/ATOR detects the most formidable air threats to our forces and will out-pace our adversaries for years to come.

Networking On the Move (NOTM) provides Fleet Marine Forces with a robust, over-the-horizon and beyond line-of-sight, digital C2 capability while on-the-move and at-the-halt. NOTM provides maneuvering forces with the ability to seamlessly conduct digital C2 through access, collaboration, and exchange of tactical voice, video, and data while using a full suite of Combat Operations Center tactical software applications and services to support decision-making, fires, and increased multi-domain situational awareness from anywhere in the battlespace. NOTM provides access to three external network enclaves (NIPR, SIPR, and Mission Specific) via wideband satellite communications services, and bridges aerial Link 16 networks to ground forces to increase lethality of dispersed forces. Mounted and dismounted users are connected to these network enclaves via Type 1 encrypted wireless local area networks. NOTM is purpose built to support our naval and joint concepts that require our forces to fight distributed while allowing commanders the ability to effectively command and control forces in a contested all-domain environment.

CAC2S provides the tactical situational display, information management, sensor and data link interface, and operational facilities for planning and execution of Marine manned and unmanned aviation missions in support of the fleet. CAC2S eliminates the current dissimilar legacy systems and adds capability for aviation combat direction and air defense functions. It provides a single networked system that integrates Marine manned and unmanned aviation operations with joint aviation C2 agencies. The Marine Corps intends to fully field CAC2S by FY 2021.

## **Air and Missile Defense**

In great power competition, forward bases and legacy infrastructure will likely be vulnerable to an enemy strike; therefore, the Marine Corps must ensure our forces possess the capabilities required to mitigate those threats for themselves, the fleet, and the joint force. Additionally, naval forces around the world face risks posed by adversaries with ready access to low-cost asymmetric capabilities – whether traditional rockets or unmanned systems – that can strike our forces. With the increasing lethality of these low-cost systems as well as long-range precision fires, air and missile defenses provide critical capabilities for the Marine Corps to protect personnel, equipment, and installations and to persist as the Nation’s “stand-in” naval expeditionary force.

The Marine Air Defense Integrated System (MADIS) family of systems is the Marine Corps’ primary program for providing short-range surface-to-air fires and electronic attack capability. The MADIS is being developed in three versions: a JLTV-integrated version, a light version, and an installation version. In July 2019, the light MADIS successfully defeated a hostile Iranian unmanned aerial vehicle in the Strait of Hormuz.

The Marine Corps also continues to pursue the Medium Range Intercept Capability to provide a defense against cruise missiles. A demonstration in August 2019 at White Sands Missile Range successfully evaluated the integration of the Israeli Tamir missile and Battle Management Control system with the Marine Corps CAC2S and G/ATOR.