NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

STATEMENT OF

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BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

DEPARTMENT OF THE NAVY AVIATION PROGRAMS

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Introduction

Chairman Norcross, Ranking Member Hartzler and distinguished members of the Subcommittee, thank you for the opportunity to appear before you today to discuss the Department of the Navy's (DoN) Fiscal Year (FY) 2021 budget request. We appreciate your leadership and steadfast support for Navy and Marine Corps aviation acquisition and research programs.

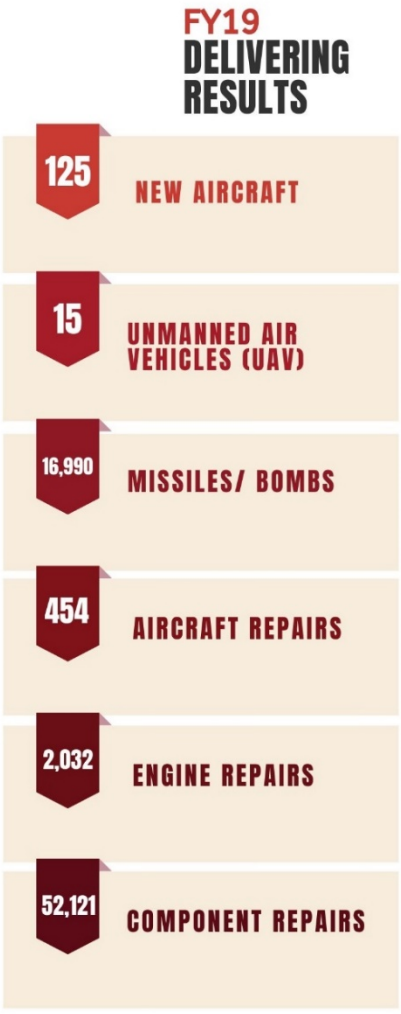
Dominant naval force and a strong maritime strategy are the primary engines of our National Defense Strategy (NDS). As we continue to face rapid change in the global security environment, including greater global trade and greater unpredictability, our national security posture must likewise change to 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 necessitates us to deliver relevant, effective, capability to our Sailors and Marines, and a constant focus on and partnership with the industrial base. They are key elements 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 19th and 20th 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 the 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. The Department of the Navy is 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 availabilities, 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

In FY 2019 we delivered 125 new manned aircraft and 15 Unmanned Air Vehicles (UAVs) to Navy and Marine Corps units, improving capability and enabling the divestiture of less affordable and less capable legacy systems. In FY 2020, the Department plans to deliver an additional 125 aircraft and two Group 5 and approximately 300 Group 1 UAVs. The DoN's FY 2021 budgets supports the procurement of 121 manned and unmanned aircraft with 537 across the Future Years Defense Program (FYDP).

Multiple aviation and weapons platforms completed key milestones last year. Long Range Anti-Ship Missile (LRASM) and MQ-4C Triton declared 'Early Operational Capability' in November and December 2019, respectively. MQ-25 completed its first test flight in September 2019 just 13 months after contract award. F-35C achieved Initial Operational Capability (IOC) in February 2019 and is tracking towards its first deployment on a CVN in FY 2021.



Aviation readiness has improved substantially because of process improvement, leveraged from commercial best practices that span aviation depot performance in component repair and heavy maintenance, organizational and intermediate level maintenance performance, supply chain reform, and reliability-centered engineering improvements. The Department achieved our goal of over an 80 percent Mission Capable (MC) F/A-18 E/F and EA-18G Primary Mission Aircraft Inventory by October 1, 2019. Our Marine Tactical Aircraft achieved the 80 percent MC goal episodically through FY 2019 – on seven separate occasions for our F/A-18A-D fleet and one occasion for our F-35 fleet. The Department is committed to maintaining these systemic improvements for the long term and expanding the success across other type/model/series aircraft. The Naval Sustainment System (NSS) is aggressively pursuing these reforms. On-time funding over multiple years will be a key enabler to maintaining these procurement and readiness gains.

Complementing efforts to improve the F/A-18 fleet's readiness, the Department made great strides in extending the service lives of these aging jets. Twenty-five F/A-18A-D aircraft underwent crucial life extension modifications, while 15 F/A-18E/F aircraft are currently in work to receive Service Life Modification (SLM) this fiscal year. The first SLM MC aircraft delivered to the fleet in January 2020. The Department continues to learn and actively manage this critical effort.

To support our focus on sustainment, the Department 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. Two aviation programs, the E-2D Hawkeye and H-1, are currently in the Sustainment Program Baseline (SPB) pilot program to align and improve performance, cost, and schedule requirements and governance throughout operations and sustainment. We will review these pilots to assess effectiveness, and plan to expand SPBs across other Navy and Marine Corps programs.

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. The Department is 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. We will be better able to compete and win by expanding that integration and continuing those efforts at scale and at speed.

The Department continues to evaluate additional opportunities for middle-tier acquisition programs such as Next Generation Naval Mission Planning System and the use of recently established Office of the Secretary of Defense acquisition pathways for further program agility. Additionally, we have successfully leveraged "Prize Challenges" for our Marine Air/Ground

Task Force, Unmanned Aerial System, Expeditionary (MUX) and the Tactical Resupply Unmanned Air System (TRUAS) to decrease the time to field.

The Department collaborated with Defense Digital Services on a joint effort providing a unique environment and opportunities for service members and civilian acquisition workforce to collaborate with and apply modern approaches and industry best practices to how the Department of Defense (DoD) buys and builds technology.

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.

Drive Affordability

Building and sustaining our Navy requires creative and aggressive contracting methods to achieve the right capability. We achieved savings through leveraging and procuring commercially available aircraft spares, process improvements to maximize efficiency and effectiveness, foreign military sales, and Multi-Year Procurements (MYP) for programs such as F/A-18, E-2D, and V-22. For the Navy, the E-2D MYP represents significant cost savings, approximately $410 million, over the lifetime of the contract. For the F/A-18E/F MYP contract, totaling approximately $4 billion, the Navy will save a minimum of $395 million. The Department also saw significant savings of over 12 percent compared to the previous Lot (delivered in 2019) with the award of the Lots 12-14 F-35 Air Vehicle contract.

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. 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. The Department 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 hiring authorities provided by Section 1111 of the 2017 NDAA to hire high quality acquisition and technology experts with a focus on Supply Chain and Sustainment challenges. This expertise is working with our Prime contractors to ensure that the Navy has the right supply base, managed in the right way to materially improve the resiliency, readiness, affordability and security of the Navy supply base in the short to medium term.

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 NDS, enabling us to deliver the people, the platforms, and the capabilities necessary to protect American interests around the world. This budget builds on prior investments while making the adjustments necessary to build and sustain a more lethal, resilient, agile, and ready aviation force. FY 2019 and FY 2020 provided key down payments on lethality, with a priority on improving our overall readiness posture.

The FY 2021 budget funding levels continue to ensure optimal fleet readiness, increasing aircraft depot maintenance and logistics funding 14 percent from FY 2020 enacted levels, allowing us to build upon the readiness gains made this past year for some of our key platforms like F/A-18 and F-35B/C. The budget also increases the Flying Hour program by 5.8 percent, maximizing executable capacity that likewise aligns

the funding for air operations to the mission capable rates to ensure that all squadrons deploy combat-ready. Additionally, Fleet Readiness Center improvements include more modern equipment, processes and workflow improvements, similar to what we're doing in our public shipyards. We are leveraging industrial best practices, including improved organizational and predictive analytics integration through the Naval Sustainment Strategy to further modernize the way we do aviation maintenance and grow our capacity.

The Department is focused on increasing the lethality and capability of our aviation portfolio through leading edge technology development and modernized platforms. The FY 2021 budget continues investment in key Navy and Marine Corps developmental programs such as CH-53K, F-35, Next Generation Jammer, and Maritime Strike Tomahawk (MST). Although the FY 2021 budget decreases from FY 2020 as we complete the buy of several type-model-series, the Department continues maintaining the F-35B/C, E-2D, and V-22 as well as the advanced helicopter training system. The Navy plans to procure the final 24 F/A-18E/F aircraft of the MYP in FY 2021 with a total procurement objective of 678. The Department also continues execution of MYPs for KC-130J, E-2D, MV-22, and CMV-22. The Department likewise provides Research, Development, Test and Evaluation (RDT&E) investments in aviation enhancements and recapitalization efforts, such as accelerating technology improvements for F-35C.

Summary

Naval Aviation operates forward - near our potential adversary’s home shores. With an increasingly complex national security environment and overt challenges to the current international order, it is imperative we deliver the ready, capable, and global sea-based and expeditionary force to meet these challenges. Our vision is to provide the right capability in the hands of the warfighter, on schedule, and in the most affordable manner possible.

We appreciate the strong support this Subcommittee has always provided our Sailors and Marines. Together we will ensure our military's capability, capacity and readiness 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.

TACTICAL AVIATION

Strike Fighter Inventory Management

The Department maintains a requirement of 785 strike fighters to meet force generation and force application obligations with nine carrier air wings. The President's FY 2021 budget request continues the Department's momentum in reducing strike fighter inventory risk through the procurement of 10 F-35Bs, 21 F-35C and the completion of F/A-18E/F multi-year contract with 24 FA-18E/F Block III Super Hornets. These efforts along with systemic improvements in Aviation readiness will provide the required combination of lethal capacity, capability and affordability for the carrier air wing now and into the future.

In tandem with these procurements, F/A-18E/F Service Life Modification (SLM) enhances our inventory by maintaining the tactical relevance of the F/A-18 E/F. This will provide the enduring capability and capacity to allow a transition to the Next Generation Air Dominance Family of Systems in the 2030's. The President's FY 2021 request funds 179 SLM inductions across the FYDP. Original Equipment Manufacturer early learning through the currently inducted aircraft will support "productionizing" SLM and Block III upgrades incorporated in SLM, and is critical in meeting throughput and schedule. The first SLM MC aircraft delivered to the fleet in January 2020. The Department is actively managing SLM performance through a Perform to Plan (P2P) approach.

Tactical Aircraft Force Mix

The Carrier Air Wing of the future focuses on coupling the 5th Generation combat capabilities resident aboard the F-35C with the weapons capacity aboard the 4th Generation F/A-18 E/F. Continued investment in the survivability and lethality in our Lightning II, Super Hornets, and future weapons will ensure Department investments directly counter and defeat our adversaries' combat advancements. The F-35C also brings other unique warfighting capabilities to the USMC and the Marine Air-Ground Task Force (MAGTF). Combined with the Tactical Air Integration commitment, the F-35C will integrate and deploy for all USMC global force commitments except Marine Expeditionary Unit deployments, which require vertical landing capability aboard L-Class ships.

The Navy has divested from legacy Hornets at the operational edge, with the Reserve component and Naval Aviation Warfighting Development Center following in 2025. This also

affords the Marine Corps the opportunity to select the remaining "best of breed" legacy Hornets to maximize the overall readiness, capacity, and capability to round out the Department's inventory.

Pilot and Aircrew Shortfalls and Mitigation Strategies

Naval Aviation continues to meet all fleet requirements. Retention and merit-based bonuses and incentive pay are showing some success in retaining Post-Command Commanders, though Aviation Department Head acceptances are still short in some type model series. The Department expects competition for talent with industry will continue, requiring a robust and competitive compensation program to recruit, retain, and distribute the force.

F-35 Joint Strike Fighter

The F-35 Joint Strike Fighter supports and enables the National Defense Strategy while driving cost down, improving quality, and ensuring timely modernization of capabilities. Both the F-35B and F-35C are vital to our future as they become the lethal cornerstone of our naval air forces. During the next 10 years, the Navy and Marine Corps will transition 21 squadrons to the F-35 as we replace our aging legacy fleet.

The Marine Corps has already established one Fleet Replacement Training Squadron, one operational test squadron, and three operational line squadrons. USMC F-35Bs are currently operating in support of two different Marine Expeditionary Units (MEUs) / Amphibious Readiness Groups from amphibious assault ships. In February 2019, the 13th MEU returned to the U.S. after conducting operations in Syria and Afghanistan. The MEU's composite Air Combat Element included six F-35Bs, the first U.S. F-35s to deploy in combat where they successfully performed deep strike and close air support missions. In addition, F-35Bs operating from Iwakuni, Japan have conducted five 31st MEU deployments – operating in Thailand for the first time - and F-35Bs will deploy in the spring in support of Her Majesty's Ship (HMS) QUEEN ELIZABETH in support of the United Kingdom's Carrier Strike Group 21. The Navy now has established one Fleet Replacement Training Squadron, has one operational squadron, and will complete transition of the first USMC F-35C squadron in August of 2020. Additionally, the first TOPGUN class incorporating the F-35C into the 4th / 5th Generation Fighter integration began in January of 2020.

The Department also remains committed to reducing F-35 costs, successfully reducing the recurring flyaway cost of the Marine Corps F-35B to no greater than $101.3 million dollars and the Navy F-35C cost to $94.4 million dollars by Low Rate Initial Production (LRIP) Lot 14. This represents a 12.3 percent and 13.2 percent reduction from LRIP Lot 11, respectively. We are also working to decrease operation and sustainment costs targeting steady state Cost Per Tail Per Year (CPTPY) of $6.8M for the F-35B by 2033, and $7.5M CPTPY for the F-35C by 2036.

The baseline program has delivered more than 490 aircraft to test, operational, and training sites (all variants) and will deliver 141 aircraft and 158 engines (all Services and partners) during calendar year 2020 on its way to a Full Rate Production / Milestone C decision in fall of 2020. The F-35 program continues to mature with base stand-up, sustainment of fielded aircraft and maturation of the global sustainment enterprise.

The FY 2021 President's budget requests $4.5 billion in Aircraft Procurement (APN) funds for 10 F-35B and 21 F-35C aircraft, modifications and spares.

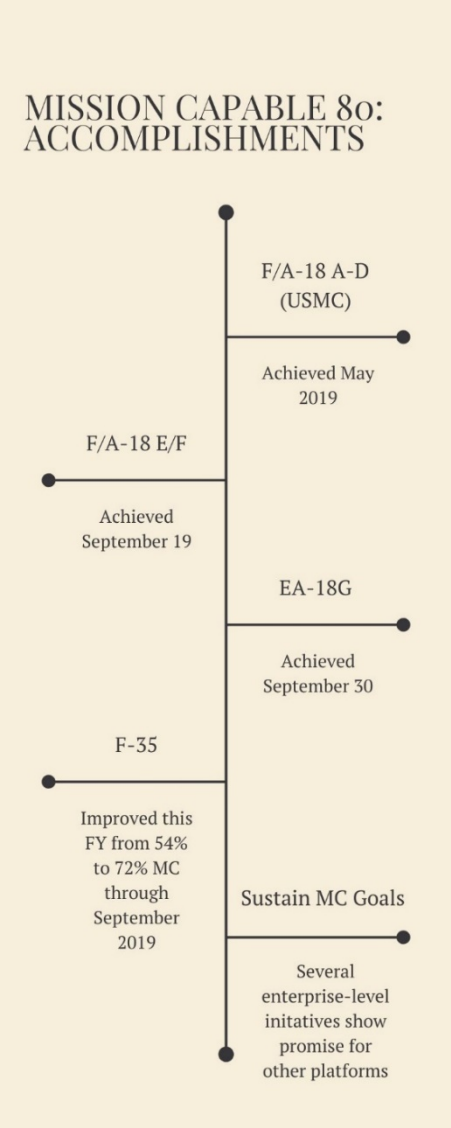
F-35 Continuous Capabilities Development and Delivery (C2D2)

With the F-35 program soon closing Block 3F System Development and Demonstration, we must continue to modernize the aircraft with advanced capabilities to maintain the advantage over advancing adversary fighters and ground-based radar threats. Towards that end, the Department restructured the original Block 4 Follow-on Modernization acquisition strategy into a more agile Continuous Capabilities Development and Delivery (C2D2) model. The C2D2 approach leverages commercial practices, develops capability in smaller, more easily managed increments, and accelerates delivery of warfighting capability. The approach also advances departmental goals of reducing C2D2 risk and lowering cost. To continue the delivery of capability to the warfighter in FY 2021, the DoN requests $794 million in RDT&E.

F/A-18 A/B/C/D Hornet

Service Life Extension Program (SLEP), High flight hour (HFH) and Center Barrel Replacement (CBR+) efforts extend the F/A-18 A-D beyond its original service life of 6,000 hours to 8,000 hours, and in select aircraft, up to 10,000 flight hours. Twenty-five aircraft underwent HFH and or CBR+ and included SLEP modifications in FY 2019 with 29 aircraft

planned for delivery in FY 2020. Along with flight hour extensions, these aircraft require capability upgrades to their radars, electronic warfare suites, and avionics systems to maintain tactical relevance and pace the threat as the Marine Corps plans to fly a portion of the legacy F/A-18 A-D fleet through the FY 2030 timeframe to bridge the transition gap to an F-35B / F--35C fleet. Overall Readiness and Sustainment of the F/A-18A-D platform average MC increased from 58 percent to 73 percent throughout calendar year 2019.



The FY 2021 budget requests $154.3 million in APN to implement aircraft commonality programs, enhance capability, improve reliability, and ensure structural safety of the F/A-18 A-D inventory, and $86.4 million for the continuation of the Hornet SLEP.

F/A-18E/F Super Hornet

The F/A-18E/F Super Hornet will be the numerically predominant aircraft in the carrier air wing (CVW) into the 2030s. Continued investment in new aircraft, capability enhancements and SLM significantly improves CVW lethality. Twenty-four F/A-18 E/F Block III Super Hornets were procured last year, and another 24 are planned for procurement this fiscal year. In tandem with these procurements, SLM initiatives and capability upgrades enhance our inventory by maintaining the tactical relevance of the F/A-18 E/F. In terms of overall Readiness and Sustainment of the F/A-18E/F platform, the average MC rate of Primary Mission Inventory Aircraft increased from 61 percent to 81 percent throughout calendar year 2019.

The FY 2021 President's Budget requests $1.76 billion in APN for procurement of the final 24 F/A-18E/F Block III Super Hornet aircraft and $140.3 million of RDT&E for improvements, radar upgrades and Block III development.

AV-8B Harrier

During FY 2019, the AV-8B Harrier program completed critical Fleet required Validation/Verifications to enhance flight safety, increase readiness and improve supply chain asset management. In addition, the program completed the last Link-16 initial installations in the Radar fleet, finalized Joint Standoff Weapon integration and separation testing, and conducted AIM-9X instrumented carriage flights for airworthiness. These upgrades were critical in 2019 in support of two back-to-back shore-based combat deployments. The platform continues to support combat deployments from MEUs.

The FY 2021 budget requests $20.1 million in RDT&E funds to continue design, development, integration and test of platform improvements. These improvements include continuation of an Engine Life Management Program, Escape System upgrades, Joint Mission Planning System updates, Link-16 Digital Interoperability (DI) integration, mission and communication systems, navigation improvements, weapons carriage updates, countermeasure improvements, and updates to an Obsolescence Replacement/Readiness Management Plan.

The FY 2021 budget also includes $34.1 million in APN to continue the incorporation of Obsolescence Replacement/Readiness Management Plan systems, electrical and structural enhancements, LITENING Pod upgrades, engine safety and operational changes, DI upgrades that include Link-16, and inventory sustainment upgrade efforts to offset obsolescence and attrition.

Next Generation Air Dominance (NGAD) Family of Systems

The Department completed its NGAD Family of Systems Analysis of Alternatives (AoA) in FY 2019 to enable the planned sunset of F/A-18E/F Super-Hornet aircraft during the 2030s. The AoA considered the widest possible range of materiel concepts while balancing capability, affordability, schedule, and supportability, along with manned and unmanned approaches to meet threat-based mission requirements.

In FY 2020, Navy's Next Generation Fighter program (F/A-XX) begins the Concept Refinement Phase. During this phase, iterative collaboration will occur between Government and industry teams leading to the development of vendor concepts that balance advanced air dominance capabilities and long-term affordability.

AIRBORNE ELECTRONIC ATTACK (AEA)

EA-18G Growler

The EA-18G Growler is a critical enabler for the Joint force, bringing fully netted electronic warfare capabilities to the fight and providing essential capabilities in the Electromagnetic Maneuver Warfare environment. The EA-18G program completed delivery in October 2019 bringing the total procurement quantity to 160 aircraft. This fulfills current Navy requirements for Airborne Electronic Attack for nine CVWs and five expeditionary squadrons plus one reserve squadron. The FY 2021 President's Budget requests $124.6 million of RDT&E for additional modernization to ensure the EA-18G maintains its edge in the electromagnetic spectrum by providing robust sensing and engagement capabilities.

Next Generation Jammer (NGJ)

The NGJ is the follow-on to the legacy AN/ALQ-99 to counter electronic warfare capabilities and keep pace with the evolving threat. NGJ will maximize the survivability and lethality of the Navy's 4th and 5th generation aviation platforms and strike weapons and support all Services and joint/coalition air, land, and sea tactical strike missions. NGJ will be implemented via three separate programs: Mid-Band (MB), Low-Band (LB), and High-Band. NGJ MB has entered developmental test, with positive results to date. The program's focus in FY 2020 is on delivery for flight and chamber testing. NGJ LB has received proposals to deliver operational prototypes to the fleet by FY 2025. Contract award is planned for late FY 2020.

The FY 2021 budget request includes $176.6 million in APN for three LRIP NGJ-MB shipset procurement, support equipment and associated support; and $170.0 million in RDT&E to continue execution of the NGJ LB Rapid Prototype/Engineering and Manufacturing Development, as well as aircraft and software integration efforts.

ASSAULT SUPPORT AND LOGISTICS SUPPORT AIRCRAFT

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. All other technical issues are on plan to support the program and contained within the Joint Program Plan. To date, the CH-53K has flown approximately 1,700 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 shipboard 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 $1.1 billion in APN for procurement of seven LRIP aircraft, including advance procurement and initial spares.

CH/MH-53E

Operational demand for CH-53E, the DoD's only heavy lift assault support aircraft, remains high. Introduction and continued execution of the H-53 Reset Initiative has significantly mitigated challenges to the material condition of CH-53E from increased operations. To date, 31 aircraft have completed reset, which returns fully MC aircraft to the fleet and recovers platform readiness, and accumulated approximately 15,400 flight hours. Reset reduces both the cost per flight hour and maintenance man-hours per flight hour as the H-53 approaches 30 plus years of service. Continued reset and sustainment initiatives are critical to the success of the CH-53E until its replacement, the CH-53K, is delivered to the fleet.

The MH-53E continues to perform its primary mission of airborne Mine Countermeasures, as well as transport of cargo and personnel, until the family of modular systems that comprise the Littoral Combat Ship (LCS) Mine Countermeasures Mission Package replaces it.

To keep the CH-53E and MH-53E viable through their remaining services lives, the FY 2021 budget requests $74.8 million in APN and $6.8 million in RDT&E. This funding provides Condition Based Maintenance software upgrades, Integrated Vehicle Monitoring Unit upgrades, cockpit upgrades, Embedded Global Positioning System / Inertial Navigation System, T-64

engine reliability improvements, survivability upgrades, and Phase II of CH-53E's Degraded Visual Environment Capability Implementation Plan. These safety and avionics upgrades are essential to address obsolescence issues within the cockpit, increase overall situational awareness, and maintain mission effectiveness.

ATTACK AND UTILITY AIRCRAFT

AH-1Z/UH-1Y

The AH-1Z and UH-1Y provide attack and utility support to the MAGTF, deploying globally with Marine Expeditionary Units. Completing procurement in FY 2019, over a decade has passed since the initial fielding of the Venom and Viper. The fleet faces obsolescence issues in software architecture, Aircraft Survivability Equipment (ASE), navigation equipment, Health and Usage Monitoring Systems, and precision-guided weapons. A predominant focus is on readiness improvements that will increase material reliability and material availability, including engineering improvements to drivetrain components and air vehicle components. Previously funded hardware retrofits continue, while concurrent efforts across the Naval Aviation Enterprise are being leveraged to maintain affordability and provide Distributed Aperture Infrared Countermeasures (DAIRCM), LINK-16, Adaptive Networking Wideband Waveform, Full Motion Video, Joint Air-to-Ground Missile, and AIM-9X capabilities.

The FY 2021 President's Budget requests $192.4 million in APN and $62.3 million in RDT&E for aircraft modernization efforts that significantly increase survivability, safety, and lethality on the modern battlefield. Future modifications to maximize standoff and facilitate teamed engagement options are planned to support Distributed Maritime and Expeditionary Advanced Based Operational environments. As all of the Services look toward future vertical lift possibilities, the Marine Corps is participating in the Joint Future Vertical Lift Program and monitoring Army Future Long-Range Assault Aircraft and Future Attack Reconnaissance Aircraft program progress to leverage lessons learned as requirements are defined.

MH-60R/S

The MH-60 R/S are the cornerstone of the Navy's helicopter concept of operations, providing multi-mission support including Anti-Submarine Warfare, Anti-Surface Warfare,

Personnel Recovery, special operations support, and combat logistics among a variety of other missions.

The FY 2021 President's Budget requests $131.6 million in APN and $41.1 million in RDT&E. APN funding supports safety related systems improvements, corrections of deficiencies, warfighter upgrades, and obsolescence issues, including mission-computer modernization and procurement of kits for the Helmet Display Targeting System, Advanced Data Transfer System, Data Link, and Very High Frequency (VHF) Omni-Directional Range / Instrument Landing System (VOR/ILS). RDT&E funding supports developmental efforts including MH-60S Service Life Assessment Program, implementation of Link-16, enabling in-flight target updates to Net Enabled Weapons, continued software development, Diminishing Manufacturing Sources and Material Shortages, engineering and developmental activities including capability and architecture studies keeping the MH-60 operationally relevant.

EXECUTIVE SUPPORT AIRCRAFT

VH-3D/VH-60N Executive Helicopter Series

The VH-3D and VH-60N continue to execute the no fail mission of Executive Helicopter Support. The FY 2021 President's Budget requests $8.2 million of APN to continue programs that ensure the in-service Presidential fleet remains safe, reliable and current. Ongoing efforts include a Communications Suite Upgrade (Wide Band Line of Sight) that provides persistent access to the strategic communications network, and the continuing Structural Enhancement Program necessary to extend platform service life for both VH-60N and VH-3D platforms. The VH-92A program directly leverages applicable technology updates from legacy platforms.

VH-92A Presidential Helicopter Replacement Aircraft

The FY 2021 President's Budget requests $99.3 million in RDT&E and $631.0 million of APN. RDT&E funding continues Engineering, Manufacturing and Development activities, to include, completion of Initial Operational Test and Evaluation and associated test reports, cyber-testing and evaluation, and completion of the Interactive Electronic Technical Manual development and verification. FY 2021 is the third and final year of the production buy, with $610.2 million APN to procure five LRIP Lot 3 aircraft and associated support, completing VH-

92A procurement. Planned retrofit modifications, $20.8 million APN, include incorporation of the Federal Aviation Administration mandated Automatic Dependent Surveillance Broadcast Out system, upgrades to the Mission Communication System servers, and shipboard interoperability.

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. The Department is 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. The Marine Corps sees promise in the use of Directed Energy (DE) weapons for C-UAS through the procurement and employment of the Compact LASER Weapons System (CLAWS). We continue to engage with the Army as the designated C-UAS Executive Agent (EA) and provide support in standing up the Joint C-UAS Office. Additionally, in partnership with the C-UAS EA, we plan to refine an open architecture solution for common C2 system, as well as, continue to improve the capability of the C-UAS family of systems.

STRIKE WEAPONS PROGRAMS

Offensive Missile Strategy (OMS)

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 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. MST, LRASM V1.1, SM-6/Block 1B, and the Naval Strike Missile). Third, the DoN 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.

Tomahawk Cruise Missile

Tactical Tomahawk (TACTOM) is the nation's premier, all-weather, long-range, survivable, deep-strike offensive weapon against fixed and mobile targets. To date, over 2000 Tomahawk combat expenditures have provided both first and surgical strikes, effectively countering conventional and asymmetric threats to US/Coalition Forces.

The FY 2021 budget requests $200.3 million in RDT&E, $462.2 million in Weapons Procurement, Navy (WPN) and $84.1 million in OPN in support of Tomahawk modernization. The Tomahawk modernization effort replaces life-limited components such as navigation and communications systems and provides opportunity to introduce maritime strike and improved warhead capabilities, transitioning TACTOM from the Block IV to the Block V configurations.

Next Generation Land Attack Weapon (NGLAW)

NGLAW will provide the next generation of long-range, kinetic strike capability to destroy high-priority fixed, stationary and moving targets – as well as those targets hardened, defended or positioned at ranges such that engagement by aviation assets would incur unacceptable risk. NGLAW will be capable of kinetic land and maritime attack from both

surface and sub-surface platforms. The NGLAW AoA has completed and the classified results have been shared with all four congressional defense committees.

Offensive Anti-Surface Warfare (OASuW) Increment 1 (LRASM)

OASuW Increment 1 (LRASM) provides Combatant Commander's the ability to conduct ASuW operations against near/mid-term high-value surface combatants protected by Integrated Air Defense Systems with long-range Surface-to-Air-Missiles and to deny adversaries sanctuary of maneuver. The program achieved Early Operational Capability on the Air Force B-1B in early FY 2019 and on the Navy's F/A-18E/F aircraft in early FY 2020. The FY 2021 President's Budget requests $35.8 million in RDT&E for LRASM V1.1 development and testing and $168.9 million in WPN to purchase LRASM All-Up-Round weapons.

Offensive Anti-Surface Warfare (OASuW) Increment 2

OASuW Increment 2 is required to deliver the long-term, air-launched ASuW capabilities to counter 2028 threats (and beyond). The Department continues to plan for OASuW Increment 2 via full and open competition. To inform the long-term path forward, the DoN will leverage the NGLAW AoA results to inform the required ASuW capabilities. The AoA study to determine the Increment 2 path-forward will complete in 3rd Qtr FY 2020. In the interim, the Navy is pursuing incremental upgrades to LRASM to bridge the gap to OASuW Increment 2 program of record. Increment 2 IOC is planned for the FY 2028-2030 timeframe.

Sidewinder Air-Intercept Missile (AIM-9X)

The FY 2021 budget requests $5.9 million in RDT&E and $126.5 million in WPN for AIM-9X. RDT&E will be applied toward the Engineering Manufacturing Development of critical hardware redesign driven by obsolescence; completion of test and fleet release of System Improvement Program missile software (Version 9.4); and design and development of Insensitive Munitions improvements. WPN funding is requested to procure a combined 270 All-Up-Rounds and Captive Air Training Missiles and associated missile/trainer related hardware.

Advanced Medium-Range Air-to-Air Missile (AMRAAM/AIM-120D)

The FY 2021 budget requests $44.3 million in RDT&E and $327 million in WPN. The RDT&E will be applied toward continued software capability enhancements to counter emerging threats; completion of test and fleet release of System Improvement Program missile. WPN funding is requested for 315 All-Up-Rounds, 10 Captive Air Missiles, and associated missile-related hardware.

Small Diameter Bomb II (SDB II)

The FY 2021 budget requests $62.5 million in RDT&E for continued development/test of the SDB II weapon, F-35 developmental testing and integration, and F/A-18E/F expanded carriage load out. The Department also requests $78.9 million in WPN to procure 357 All-Up-Round weapons.

Advanced Anti-Radiation Guided Missile (AARGM) & AARGM Extended-Range (AARGM-ER)

AARGM production will begin to ramp down in FY 2021 in support of the transition to AARGM-ER. AARGM-ER provides the Department with an extended range asset to project power and provide Suppression of Enemy Air Defenses, both at-sea and on land. The FY 2021 RDT&E budget requests $6.3 million for Anti-Radiation Missile Foreign Material Assessment; $11.2 million for AARGM Advanced Development, Follow-On Test and Evaluation Correction of Deficiencies, and System Capability Upgrades; and $128.6 million for AARGM-ER development. The Department also requests $86.1 million in WPN for production of 87 baseline AARGM Block 1 modification kits for integration into All-Up-Rounds, and $61.5 million in WPN for production of 24 AARGM-ER All-Up-Round weapons and six Captive Air Training Missiles.

Harpoon II+

The FY 2021 budget request does not include procurement funds for additional Harpoon HII+. However, the Navy will continue to receive Harpoon II+ missiles via a Sales Exchange Agreement. Additionally, in FY 2021 the Navy is continuing maintenance efforts to restore the Encapsulated Harpoon capability to the sub surface fleet.

Joint Air-to-Ground Missile (JAGM)

The FY 2021 budget requests $12.7 million in RDT&E for software development, AH-1Z platform integration, modeling and simulation, and completion of Developmental Testing, and Integration Testing in support of fleet release SCS-8.2.3. The budget request also includes $49.4 million in WPN to procure 203 tactical missiles and four Captive Air Training Missiles.

Advanced Precision Kill Weapon System II (APKWS II)

APKWS II provides high-stowed precision capability combined with low-yield warheads to reduce the risk of collateral damage while achieving the desired effect on the target. The FY 2021 budget requests $24.9 million in Procurement of Ammunition, Navy and Marine Corps (PANMC) for procurement of 1,086 APKWS II guidance section kits (850 Base and 236 OCO) for use on both rotary-wing and fixed-wing platforms.

Direct Attack Weapons and General Purpose Bombs

Fully funding the General Purpose Bombs, Joint Direct Attack Munition (JDAM) line items are critical to building and maintaining the DoN's direct attack weapons inventory. The FY 2021 budget requests $49.6 million for General Purpose Bombs, $80.2 million to procure 3,538 JDAM kits, and $51.4 million for more affordable practice bombs to enhance readiness and prepare for future contingencies.

Addendum A

SAFETY
(Part 1 of 2)

Minimizing the risk of Physiological Episodes (PE) continues to be Naval Aviation's top safety priority and will remain so until all causal factors are understood and mitigated. The Navy has identified multiple interrelated causal factors as contributing to PE, and the current mitigation efforts, including aircraft modifications, aircrew training, and improved maintenance practices, are positively affecting the PE rate for all Type/Model/Series aircraft, and most notably in T-45s and F/A-18s. With these mitigations, Naval Aviation is currently meeting operational requirements and personnel are working in an operationally safe environment.

The T-45 aircraft has witnessed a substantial reduction in its overall PE rate. The PE rate prior to concentrated PE mitigation efforts in June 2017 was 45.3 events per 100,000 flight hours and the mitigation rate as of January 2020 is 8.7 events per 100,000 flight hours, an eighty-one percent reduction. The T-45 Root Cause Corrective Action (RCCA) team completed its review of PEs, and the RCCA team, along with medical doctors and a toxicologist ruled out contaminants as a causal factor in T-45 PEs. The root cause analysis found no single cause of PE but a stacking of factors deriving from the aircraft, aviator equipment, aviator health and training. As a result of the RCCA, T-45 is mitigating low engine bleed air pressure to the Oxygen Concentrator, integrating an Automatic Backup Oxygen System (ABOS) and integrating a new Oxygen Concentrator to improve oxygen generating system performance overall. In FY 2019, an ABOS Critical Design Review (CDR) and a Preliminary Design Review of the new Oxygen Concentrator was completed. Modification of the T-45 Environment Control System (ECS) continues in 2020.

In the F/A-18 aircraft, the Navy implemented changes that are improving the ECS, increasing system reliability and improving the cockpit environment for our aviators. In Legacy aircraft (F/A-18 A-D), the Department has seen an over eighty percent reduction in PE rates, largely due to implementation of Air Frame Bulletin (AFB) 821, which placed life-limits on seven ECS high-time components. Super Hornet and Growler have seen PE rate drop over fifty percent since the peak in 2017. This is largely due to the fielding of the Hornet health Assessment and Readiness Tool, which can identify ECS components prior to failure, preventing a possible PE. The RCCA team identified premature component failure as a contributory factor

in almost 300 PEs. All of those components are under re-design and began the Fleet implementation in 2Q of FY 2020. We continue to collaborate across the DoD to leverage research efforts to help characterize the cockpit environment to ensure we reach long-range, holistic solutions. The RCCA has completed their investigations confirming the high quality of the On Board Oxygen Generating System (OBOGS) oxygen and ruling out contamination as a contributor to PEs. Efforts have begun to redesign the Life Support Systems to update OBOGS input specifications and fielding of multiple ECS components to improve cockpit pressure stability and reliability. We continue to work with industry partners to develop a new OBOGS concentrator for the F/A-18 and EA-18 aircraft. This effort will provide digital data logging of performance, increased reliability and oxygen scheduling in alignment with military standards.

The Department will continue to provide Flag-level leadership and oversight to this critical effort across Naval Aviation. Our engineers, industry partners, physiologists and outside support will continue to work diligently to drive PE to the lowest possible level.

SAFETY
(Part 2 of 2)

Class A, B, and C Aviation-Related Safety Issues Summary

A summary of all Naval Aviation Class A, B and C aviation-related safety issues, including recent mishaps, trends, and analysis from October 2017 through January 2020 follows. The rates presented in the table are based on total mishaps per 100,000 flight hours and include Flight, Flight-Related and Ground mishaps.

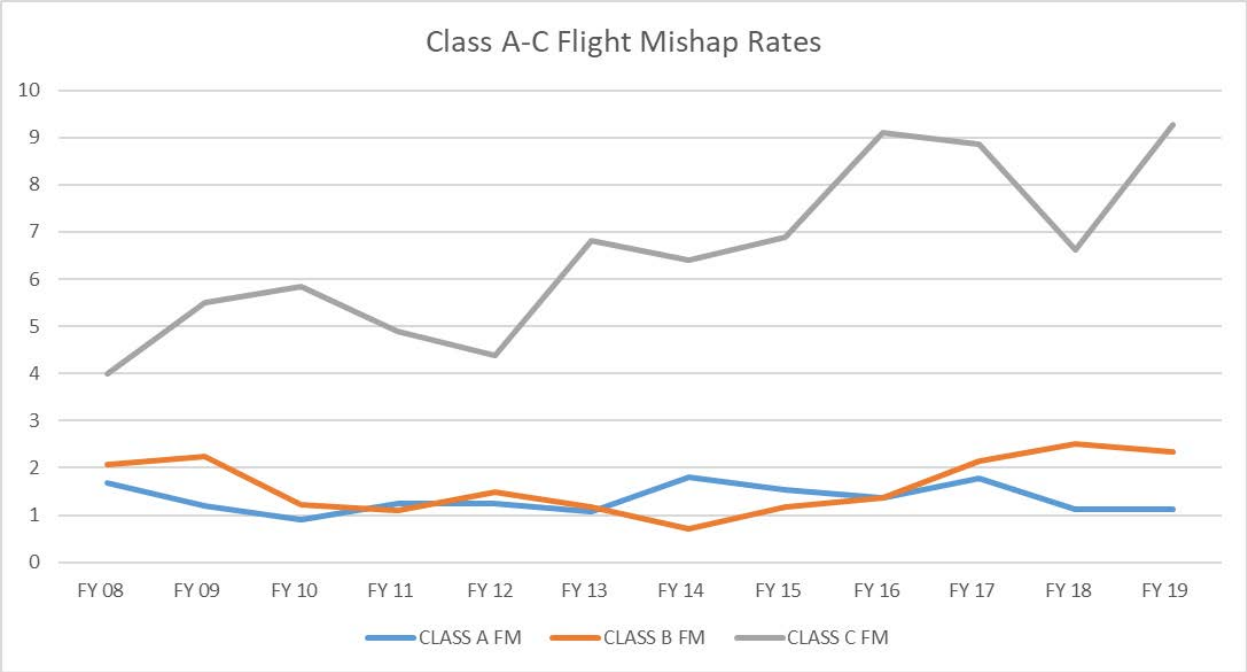
Year	Flight Hours	Class A	Class A Rate	Class B	Class B Rate	Class C	Class C Rate
FY18	1,072,229	17	1.59	38	3.54	222	20.70
FY19	1,066,739	16	1.50	39	3.66	194	18.19

The most recent (FY 2019-31 Jan 2020) DoN flight Class A mishaps include:

- 27 Jan 2020: (OCEANA NAS) F/A-18F received FOD damage to both engines during day in-flight refueling training flight.
- 25 Jan 2020: (Philippine, Sea) MH-60S went down in open ocean during daytime flight off ship. All crewmembers were rescued**.**
- 16 Dec 2019:(W-72 Range) F/A-18F Basket slap during inflight refueling caused FOD damage on both engines of receiving aircraft.
- 02 Oct 2019: (NAS Pax River, MD) E-6B struck bird and sustained engine damage during touch and go landing. Aircraft landed safely, no injuries.
- 09 Aug 2019: (Arabian Sea) E-2D During a bolter, an E-2D struck four aircraft on flight deck. Diverted safely. No injuries.
- 31 Jul 2019:(Near Death Valley National Park Rainbow Canyon) F/A-18E: Aircraft impacted canyon wall during low altitude training. Pilot died in crash. 7 Civilians Injured.
- 06 Jun 2019: (Imperial, CA) CH-53E experienced a fire upon takeoff. Aircraft safely landed at civilian airport. No significant injuries noted.
- 20 May 2019: (Cherry Point, NC) AV-8B During Functional Check Flight, in landing pattern AV-8B Harrier pilot ejected resulting in complete aircraft loss. No fatalities.
- 10 May 2019: (NAS Kingsville, TX) T-45 engine failure on short final. Both aircrew ejected successfully.
- 06 May 2019: (Iwakuni, JPN) F-35B aircraft aborted take-off due to bird strike. There were no injuries or damage to civilian or DOD infrastructure.
- 03 May 2019: (Mountain Home AFB, ID) F/A-18D - While conducting PMCF, aircraft had an engine bay fire. Aircraft recovered to airfield. Aircrew uninjured.
- 30 Mar 2019: (Yuma, AZ) AH-1Z Viper struck ground during a nighttime training mission. Two aircrew fatalities..
- 28 Feb 2019: (MCAS Miramar, CA) Two F/A-18C's collided in mid-air while conducting CAS. Both aircraft landed safely. No injuries.
- 05 Dec 2018: (Philippine Sea) F/A-18D and KC-130J collided while performing fixed wing aerial refueling mission. F/A-18 aircrew ejected with one fatality. 5 aircrew fatalities in the KC-130.
- 12 Nov 2018: (Philippine Sea) F/A-18F aircraft malfunction resulting in loss of aircraft; aircrew recovered and in stable condition.
- 18 Oct 2018: (Pacific Ocean) MH-60R crashed on takeoff onboard CVN.

DoN Class A aviation ground and Flight Related mishaps (AGM and FRM):

- 06 Aug 2019: (SOCAL Op Area) MH-60R Airborne Low Frequency Sonar Assembly departed the aircraft into the ocean. (FRM)
- 07 Feb 2019: (Tinker AFB, OK) E-6B being towed out of a hangar when vertical stabilizer struck the hangar. (AGM)
- 09 Dec 2018: (MCAS New River, NC) CH-53E landing gear inadvertently retracted during ground taxi. (AGM)
- 09 Oct 2018: (Kadena AFB, Japan) Two HH-60H helicopters taxied into each other on the taxi ramp. No injuries. (AGM)



DoN Historical Mishap Rate Trend per 100K Flight Hours per Mishap Class