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THE HOUSE ARMED SERVICES COMMITTEE
TACTICAL AIR AND LAND FORCES
SUBCOMMITTEE

STATEMENT OF

VICE ADMIRAL PAUL GROSKLAGS
REPRESENTING THE ASSISTANT SECRETARY OF THE NAVY
(RESEARCH, DEVELOPMENT AND ACQUISITION)

AND

LIEUTENANT GENERAL STEVEN RUDDER
DEPUTY COMMANDANT FOR AVIATION

AND

REAR ADMIRAL SCOTT CONN
DIRECTOR AIR WARFARE

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

DEPARTMENT OF THE NAVY'S AVIATION PROGRAMS

APRIL 12, 2018

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INTRODUCTION

Mr. Chairman, Ranking Member Tsongas and distinguished members of the Subcommittee, we thank you for the opportunity to appear before you today to discuss the Department of the Navy's (DoN) Fiscal Year (FY) 2019 aviation programs. Our budget request aligns to the current National Defense Strategy which identifies a more complex global security environment characterized by overt challenges to the current international order and the resurgence of long-term, strategic competition between nations. This request recognizes that we are emerging from a period of strategic atrophy that has resulted in the erosion of some of our competitive military advantage.

DoN aviation remains highly capable today and we are prepared to respond as the nation requires. The Navy-Marine Corps team provides a maritime strike and expeditionary power projection force that is continuously forward-deployed. We provide the persistent presence and multi-mission capabilities that represent a majority of U.S. influence across the global commons. To protect our Nation and support our allies and partners, Naval Aviation programs require your continued support. As we prioritize our preparedness, we request your assistance to improve the resilience of our current force posture, modernize key capabilities, and accelerate technological advancements to address new adversary challenges in every domain.

Our FY 2019 investments are focused, balanced and prioritized to deliver a ready, capable, global sea-based and expeditionary force. We request your support for the continued transition of the major components of the Carrier Air Wing (CVW), Expeditionary Strike Group, Amphibious Ready Group, and land-based Expeditionary Wings. We ask you to help us expand on the assimilation and teaming of manned and unmanned systems and the further integration of advanced platforms, sensors, networks, the electromagnetic spectrum and long-range strike weapons that provide the necessary military advantage over those challenging the global posture.

As part of our enduring commitment to fiscal responsibility and accelerating delivery of advanced capabilities to the warfighter, the Department continues its pursuits of accelerated acquisition and business process reforms.

We are maturing accelerated acquisition authorities Congress provided under the FY 2017 National Defense Authorization Act (Sections 803, 804 and 806). These new measures include implementation of accelerated acquisition policies for Rapid Prototyping, Experimentation and Demonstration, establishment of Maritime Accelerated Capability Office programs, and the use of Rapid Deployment Capability processes. As part of these efforts, we are actively promoting innovation, government/academia partnerships, and the transition of key manufacturing technologies and processes with investments focused on affordability and those most beneficial to the warfighter.

Our business reform measures include new focus on achieving full auditability of operations, improving financial control systems, and providing advanced tools to our workforce to better understand, manage and reduce cost. We intend to reform our business operations and leverage savings to improve readiness and increase the lethality and capacity of Naval Aviation.

The strategic environment continues to be complex, uncertain, and technologically advanced; the proliferation of modern conventional and cyber weapons from state and non-state actors is anticipated to propagate as rival states and organizations attempt to contest our influence. With the sustained support of Congress we can begin to restore our competitive naval advantage, enhance global deterrence, and ensure Naval Aviation remains uncontested in an increasingly complex global security environment.

TACTICAL AVIATION

Strike Fighter Inventory Management Overview

The Naval Aviation Enterprise continues to actively manage strike fighter inventory challenges. The President's FY 2019 budget request puts us on track to reach

our desired force structure no later than FY 2022 (est.). The key enabler will be stable, on-time funding over multiple years to achieve the desired results.

The FY 2019 request addresses the strike fighter shortfall with procurement of 20 F-35Bs, nine F-35Cs, 24 FA-18E/F Block III Super Hornets and additional aircraft across the FYDP. In tandem with these procurements, Service Life Modification (SLM) initiatives and capability upgrades enhance our inventory by maintaining the tactical relevance of the F/A-18 E/F and legacy F/A-18 A-D aircraft.

Based on current requirements and inventory modeling, we will maintain a portion of the Navy and Marine Corps F/A-18 A-D aircraft to meet operational requirements through the FY 2030 timeframe. Navy will expedite its divestiture from the legacy Hornet – seven years ahead of schedule – with the last Navy active component squadron transitioning to the F/A-18E/F in 2018. As the Navy divests legacy F/A-18 A-D, the "best of breed" aircraft will be transferred to the Marine Corps, Naval Warfare Development Center, Blue Angels, and the Naval Reserves. The FY 2019 request will allow the DoN to completely divest from the legacy A-D Hornets no later than the FY 2030 timeframe.

F-35 Joint Strike Fighter

The F-35 Lightning II will form the backbone of U.S. air combat superiority for decades to come. Whether the mission requires the execution of strike, close air support (CAS), counter air, escort, or electronic warfare (EW), both the F-35B and F-35C are vital to our future as they become the lethal cornerstone of our naval air forces. The Navy and Marine Corps will transition 25 squadrons over the next 10 years as we replace our aging legacy fleet. Delivering this transformational capability to front-line forces as soon as possible remains a top priority.

The DoN is committed to reducing F-35 costs. The Department's goal is to reduce the flyaway cost of the Marine Corps F-35B to be no greater than $104 million dollars and the Navy F-35C cost to be no greater than $98 million dollars no later than Low Rate

Initial Production (LRIP) Lot 14. We are also working to decrease operation and sustainment costs by 30 percent over current projections.

The baseline program has delivered over 250 aircraft to test, operational, and training sites. The F-35 program continues to mature with base stand-up, sustainment of fielded aircraft and maturation of a global sustainment enterprise.

The FY 2019 President's budget requests $4.2 billion in Aircraft Procurement funds (APN) for 20 F-35B and nine F-35C aircraft, modifications and spares.

F-35 Continuous Capabilities Development and Delivery (C2D2)

As the F-35 program looks to close 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 is restructuring 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. In support of FY 2019 C2D2 ramp-up we request $644.0 million in Research, Development, Test, and Evaluation funds (RDT&E).

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

Service Life Extension Plan (SLEP) efforts extended 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. Along with flight hour extensions, these aircraft require capability upgrades to maintain tactical relevance 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.

The FY 2019 budget requests $273.2 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 $67.0 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 CVWs into the mid-late 2030s. Continued investment in new aircraft and capability upgrades and flight hour extensions significantly improves CVW lethality.

The FY 2019 President's Budget requests $1.99 billion in APN for procurement of 24 F/A-18E/F Super Hornet aircraft and $301.4 million of RDT&E for Block III, Infrared Search & Track (IRST) development/test, F/A-18E/F SLM initiatives and RADAR upgrades.

AV-8B Harrier

The FY 2019 budget requests $46.4 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, Operational Flight Program block upgrades (mission and communication systems), navigation improvements, weapons carriage updates, countermeasure improvements, and updates to an Obsolescence Replacement/Readiness Management Plan.

The FY 2019 budget also includes $58.6 million in APN to continue the incorporation of Obsolescence Replacement/Readiness Management Plan systems, electrical and structural enhancements, LITENING Pod upgrades, F402-RR-408 engine safety and operational changes, DI upgrades that include Link 16, and inventory sustainment and upgrade efforts to offset obsolescence and attrition.

Next Generation Air Dominance (NGAD) Family of Systems

The Department is continuing a Next Generation Air Dominance (NGAD) Analysis of Alternatives (AoA) to address the anticipated retirement of the F/A-18E/F and EA-18G aircraft beginning in the mid-2030s.

The Joint Chiefs of Staff approved the Initial Capabilities Document that frames NGAD study requirements to support the full range of military operations from carrier-based platforms. The AoA is considering the widest possible range of materiel concepts while balancing capability, cost/affordability, schedule, and supportability. It will assess manned, unmanned, and optionally manned approaches to fulfill predicted 2030+ mission requirements. Analyses will consider baseline programs of record (current platforms), evolutionary or incremental upgrades to baseline programs (including derivative platforms), and new development systems or aircraft to meet identified gaps in required capability. We anticipate the NGAD AoA to report out in FY 2019.

AIRBORNE ELECTONIC ATTACK (AEA)

EA-18G Growler

The EA-18G Growler is a critical enabler for the Joint force as it brings fully netted electronic warfare capabilities to the fight, providing essential capabilities in the Electromagnetic Maneuver Warfare environment.

The EA-18G program will complete deliveries in FY 2018, with a total procurement quantity of 160 aircraft. This fulfills current Navy requirements for Airborne Electronic Attack (AEA) for nine CVWs and five expeditionary squadrons plus one reserve squadron.

The FY 2019 President's Budget requests $147.4 million of RDT&E for additional modernization to ensure the EA-18G maintains its edge in the electromagnetic spectrum domain.

EA-6B Prowler

The Marine Corps currently has one remaining operational EA-6B squadron to support joint AEA operational requirements through FY 2018. These organic AEA capabilities include the Intrepid Tiger II EW pod, which provides communications electronic attack and support for the Marine Air-Ground Task Force (MAGTF). The FY 2019 President's Budget request includes $18.5 million in RDT&E and $11.5 million in APN for Intrepid Tiger II updates and procurement.

Next Generation Jammer (NGJ)

The NGJ is the follow-on to the legacy AN/ALQ-99 initially fielded in 1971. The ALQ-99 has reached capability limits both technologically and materially and is challenged against modern state-of-the-art digital surface-to-air missiles systems. NGJ will provide improved capability in support of Joint and coalition air, land and sea tactical strike missions and is critical to Navy's vision for the future of strike warfare. It will become the Defense Department's only comprehensive tactical airborne electronic attack platform and is essential to counter current and emerging threats.

NGJ will be implemented in three increments: Mid-Band (formerly known as Increment 1), Low-Band (formerly known as Increment 2), and High-Band (formerly known as Increment 3). The April 2017 NGJ-Mid-Band Critical Design Review revealed deficiencies in the design of the pod structure that necessitated a redesign effort to meet air worthiness requirements. The information available to date about this redesign indicates a potential for a schedule impact of more than six months. A collaborative government/industry analysis effort to redesign the structure is expected to complete in April/May 2018. Once the redesign of the pod structure is complete, we will realize the full impact to the NGJ-Mid-Band program. Independent of the structural issue, the design, integration, manufacture, and testing of all other pod components, sub-assemblies (such as the arrays, power generation, cooling, common electronics unit), and software continue. Platform integration efforts remain aligned to the EA-18G H16 System

Software schedule; the next Generation Jammer Low Band program is investigating possible accelerated acquisition strategies to accelerate Initial Operating Capability (IOC).

Our FY 2019 budget requests $459.5 million in RDT&E to maintain Mid-Band schedule, continue procurement and assembly of the Engineering and Development Models, and commence developmental flight testing. In addition, we also request $115.3 million RDT&E to complete Low-Band technology feasibility studies and initiate technology demonstration efforts.

AIRBORNE EARLY WARNING AIRCRAFT

E-2D Advanced Hawkeye (AHE)

The E-2D AHE is the Navy's carrier-based Airborne Early Warning and Battle Management Command and Control system. The E-2D AHE provides Theater Air and Missile Defense and is a cornerstone of the Naval Integrated Fire Control – Counter Air system of systems capability.

The FY 2019 President's Budget requests $223.6 million in RDT&E for continuation of added capabilities, to include Aerial Refueling, Secret Internet Protocol Router chat, Advanced Mid-Term Interoperability Improvement Program, Counter Electronic Attack, Multifunctional Information Distribution System /Joint Tactical Radio System Tactical Targeting Network Technology, Sensor Netting, and Data Fusion, Navigation Warfare, Fighter to Fighter Backlink, ALQ-217 Electronic Support Measures, and Crypto Modernization/Frequency Remapping.

In the first year of what will be a 24 aircraft Multi-Year Procurement contract covering FYs 2019-2023, the budget also requests $983.4 million in APN for four Full Rate Production (FRP) Lot 7 aircraft and Advance Procurement for FY 2020 FRP Lot 8 aircraft.

ASSAULT SUPPORT AND LOGISTICS SUPPORT AIRCRAFT

MV-22B/CMV-22B

The FY 2019 President's Budget requests $143.1 million in RDT&E for continued product improvements and development of the Navy variant, the CMV-22B; $843.2 million in APN for seven Lot 23 CMV-22Bs, procurement of long lead items for FY 2020 (Lot 24) aircraft; and $214.8 million to support 'Operations and Safety Improvement Programs' (OSIPs). Planned OSIP efforts include the correction of deficiencies, readiness improvements, common configuration modernization, aerial refueling, and avionics improvements.

C-2 Greyhound

As the DoN recapitalizes the long-range aerial logistics support and Carrier Onboard Delivery (COD) capabilities with CMV-22B, the C-2A fleet will continue to provide critical COD support for operations worldwide until the FY 2024 timeframe. The FY 2019 budget request provides for $11.32 million in APN and $0.8 million in RDT&E to manage remaining C-2A aircraft mission systems obsolescence, including critical Center Wing Section repair kits to maintain sufficient capacity and readiness to safely complete the transition to CMV-22B.

CH-53K Heavy Lift Replacement Program

The FY 2019 President's Budget requests $326.9 million in RDT&E to continue the CH-53K Engineering Manufacturing Development phase and $1.3 billion in APN for procurement of eight Lot 3 LRIP aircraft, including Advance Procurement and initial spares.

During FY 2019, the program will continue to execute developmental test flights including propulsion testing, initial shipboard testing, avionics qualification testing, service ceiling testing, and hot/high altitude testing.

CH/MH-53E

To keep the CH-53E and MH-53E viable through their remaining services lives, the FY 2019 President's Budget requests $52.0 million in APN and $17.0 million in RDT&E. The funding will provide for Condition Based Maintenance software upgrades, cockpit upgrades, Embedded Global Positioning System/Inertial Navigation System, T-64 engine reliability improvements, survivability upgrades, satellite communications kits, and Phase I of CH-53E's Degraded Visual Environment capability. These critical safety and avionics upgrades are essential to address obsolescence issues within the cockpit, increase overall situational awareness, and maintain mission effectiveness.

Maintenance on both variants of the H-53E becomes more challenging as they approach 30 years of service. The unprecedented operational demand of the CH-53E degraded the material condition of the heavy lift assault support aircraft sooner than expected; therefore, modernization to the CH-53K King Stallion is vital. The MH-53E will continue to perform its primary mission of airborne Mine Countermeasures as well as transport of cargo and personnel until it is replaced by the Littoral Combat Ship (LCS).

ATTACK AND UTILITY AIRCRAFT

AH-1Z/UH-1Y

The FY 2019 President's Budget requests $907.9 million in APN for 25 AH-1Z aircraft and system improvements and $58.1 million in RDT&E for continued product improvements/upgrades.

The H-1 upgrades program integrates a DI environment established throughout the MAGTF. H-1 DI and Full Motion Video efforts have expanded this capability for both the Venom and the Viper. With the integration of Intrepid Tiger II, the Marine Corps' Light Attack Helicopter Squadron community provides MAGTF Commanders multi-domain maneuverability.

MH-60R/S

The FY 2019 President's Budget requests $130.7 million in APN and $23.4 million in RDT&E. APN funds support safety related systems improvements, correction of deficiencies, warfighter upgrades, and obsolescence issues such as Mission Computer modernization and procurement of kits for the Helmet Display Targeting System and Advanced Data Transfer System. RDT&E,N is requested to support development efforts that include MH-60S Service Life Assessment Program, software integration of the Advanced Off-board Electronic Warfare pod, and implementation of Link-16 J11 and J12.6 series messages that will enabling the helicopter to provide in-flight target updates to Net Enabled Weapons.

EXECUTIVE SUPPORT AIRCRAFT

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

The FY 2019 President's Budget requests $23.6 million of APN to continue programs that ensure the in-service Presidential fleet remains safe and reliable. Ongoing efforts include a Communications Suite Upgrade (Wide Band Line of Sight) that provides persistent access to the strategic communications network, the continuing Structural Enhancement Program necessary to extend platform service life, and Obsolescence Management needed to sustain and improve system readiness for both VH-60N and VH-3D platforms. The Cabin Interior and Environmental Control System upgrade is a critical obsolescence management effort for the VH-3D, reducing aircraft operational weight and improving maintainability. Where appropriate, technology updates for legacy platforms will be directly leveraged for the benefit of the VH-92A program.

VH-92A Presidential Helicopter Replacement Aircraft

The FY 2019 President's Budget requests $245.1 million in RDT&E to continue Engineering Development Model (EDM) activities, to include, contractor test for airworthiness certification and modifications of EDM and System Demonstration Test

Article aircraft. Additionally, $649.0 million of APN is requested to procure six LRIP Lot 1 aircraft and associated support.

FIXED-WING AIRCRAFT

KC-130J (USMC)

The FY 2019 President's Budget requests $270.4 million to procure two KC-130Js and spares as part of a proposed multi-year procurement (MYP III) and $78.1 million in APN for targeted improvements. Key improvements include increased survivability through advanced electronic countermeasure modernization and obsolescence upgrades to the Harvest HAWK Intelligence, Surveillance and Reconnaissance/Weapon Mission Kit. The obsolescence upgrade includes compatibility with additional Hellfire variants and an improved full motion video data-link. Today, the KC-130J remains in high demand, providing tactical air-to-air refueling, assault support, CAS and Multi-sensor Imagery Reconnaissance capabilities in support of Special Purpose MAGTFs and deployed Marine Expeditionary Units.

KC-130J (Navy)

New in the FY 2019 President's Budget, Navy has started a recapitalization effort for its legacy C/KC-130T aircraft. This initiative creates a uniform DoN procurement of KC-130J model aircraft. To support the plan, we request $12.0 million in FY 2019 APN (Advance Procurement) to pay for up-front costs needed to support the multi-service KC-130J MYP III. This effort begins the recapitalization of a 25 aircraft program of record.

MARITIME SUPPORT AIRCRAFT

P-8A Poseidon

The P-8A Poseidon recapitalizes the wide area Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASuW) and armed ISR capabilities of the aging P-3C Orion. The P-8A combines the proven reliability of the commercial 737 airframe with modern

avionics that enables the integration of modern sensors and robust military communications.

In FY 2019, we request $1.98 billion in APN for ten aircraft and $197.7 million in RDT&E for aircraft updates to include the addition of Networked Enabled Weapons capabilities, satellite communications, track management and sensor fusion capability.

P-3C Orion

The aging P-3C fleet will continue to provide critical ASW, ASuW and ISR support for operations worldwide until the fleet completes transition to P-8A. The FY 2019 budget request includes $0.8 million to manage P-3C aircraft mission systems obsolescence and $2.13 million to fund the P-3 Fatigue Life Management Program to maintain sufficient airframe safety margins and capacity to complete transition to P-8A.

EP-3 Aries

The EP-3E Aries is currently Navy's only Maritime ISR and Signals Intelligence (SIGINT) platform. The Joint Airborne SIGINT Common Configuration includes Multi-INT sensors, robust communication, and data links employed by the P-3 air vehicle to ensure effective fleet support across the full spectrum of military operations.

The FY 2011 National Defense Authorization Act directed the Navy to sustain EP-3E airframe and associated mission systems to minimize SIGINT capability gaps until the systems are fully recapitalized with a system or family of systems that in aggregate provide equal or better capability and capacity. The Navy’s family of systems approach to ISR shifts the focus from platforms to payloads to deliver increased capacity and persistence by the end of this decade. To support these efforts, we request $9.0 million for the EP-3 program as we transition Navy’s maritime ISR.

C-40A

The C-40A is a military variant of the Boeing 737-700C, a combination passenger/cargo aircraft, with military avionics and aircraft survivability equipment. In FY 2019, we request $206 million in APN to procure two C-40As for the Marine Corps.

UNMANNED AIRCRAFT SYSTEMS (UAS)

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

MQ-4C Triton UAS

The FY 2019 President's Budget requests $14.4 million in RDT&E to continue Triton baseline development activities; $219.9 million in RDT&E for Multi-INT modernization; and $719.4 million of APN for procurement of the fourth lot of LRIP aircraft and spares, retrofit of the LRIP Lot 1 aircraft to the Multi-INT configuration, and procurement of long-lead materials for the fifth lot of LRIP aircraft.

MQ-25 Stingray

MQ-25 will deliver the Navy's first carrier-based UAS to function primarily as a mission tanker to extend the range, reach, and lethality of the CVW, with secondary recovery tanking and ISR capabilities. MQ-25 will reduce current use of F/A-18E/Fs as CVW tankers, freeing F/A-18E/Fs to execute strike fighter missions, effectively increasing strike fighter capacity within the CVW. The FY 2019 President's Budget requests $718.9 million in RDT&E for MQ-25 development activities.

MQ-8 Fire Scout

The MQ-8 Fire Scout is a rotary-wing system that includes two airframe types, the MQ-8B and MQ-8C. The MQ-8C is a larger, more capable and more cost-effective airframe that uses the same mission control system, avionics and payloads as the MQ-8B. Both systems are designed to operate from any suitably-equipped air-capable ship, carry modular mission payloads, and operate using the Tactical Control System (TCS) and Line-Of-Sight Tactical Common Data Link.

In FY 2019, we request $9.8 million of RDT&E to continue hardware and software modifications, payload integration, cyber vulnerability closure and safety capability improvements and $92.7 million in APN to procure four MQ-8 mission control systems and three MQ-8C Active Electronically Scanned Array radar kits. Included in the procurement request is support for ancillary shipboard equipment, trainers/aircraft support equipment, technical support, and the logistics to outfit suitably-equipped air-capable ships and train the associated Aviation Detachments.

Tactical Control System (TCS)

The FY 2019 President's Budget requests $8.5 million in RDT&E for the MQ-8 System’s TCS. TCS provides a standards-compliant open architecture with scalable command and control capabilities for the MQ-8 Fire Scout system. In FY 2019, we will continue the transition of the Linux operating system to a technology refreshed mission control system, enhance the MQ-8 System’s Automatic Identification System and sensor track generation integration with ship systems, overcome hardware obsolescence issues with the Solaris based control stations, provide lower cost software updates using DoD common application software, and enhance collaboration with the Navy's future UAS Common Control System.

RQ-21A Blackjack

The FY 2019 President's Budget requests $16.3 million in RDT&E ($5.4 million USN, $10.9 million USMC) and $21.8 million in APN for support of Marine Corps and Naval Special Warfare forces to address ISR capability requirements.

MAGTF Expeditionary UAS (MUX)

As the Marine Corps recapitalizes toward a more diverse, lethal, amphibious and middleweight expeditionary force, Marines require a UAS that is network-enabled, digitally interoperable, and built to execute responsive, persistent, lethal, and adaptive full-spectrum operations. MUX is planned to be the system that will provide the MEF/MEB-sized MAGTF with an advanced multi-mission platform.

The FY 2019 budget requests $20.4 million in RDT&E for the MUX program to conduct an AoA and begin development of an acquisition strategy; $4.9 million in RDT&E for KMAX operations (i.e. CQ-24A Cargo UAS Experimentation and Support Services) in support of MUX technology demonstrations and Concept of Operation development (included under the MUX line).

Common Control System (CCS)

The FY 2019 President's Budget requests $49 million in RDT&E and Other Procurement Navy (OPN) for continuation of Common Control System (CCS) activities. The primary mission of CCS is to provide common control across the Navy's unmanned systems (UxS) portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation, improve cost control, and enable rapid integration of UxS capabilities across all domains (air, surface, sub-surface, and ground). CCS leverages existing government owned software to provide UxS Vehicle Management (VM), Mission Management (MM) and Mission Planning (MP) capabilities. CCS uses an open and modular architecture and will integrate with MQ-8B/C in FY 2019 with future integration of MQ-4 and Large

Displacement Unmanned Undersea Vehicle. CCS VM (Increment 1) was delivered to the MQ-25 program office in FY 2017 and planned updates are being accelerated to maintain alignment with the MQ-25 schedule. In FY 2019, CCS/Increment 1 will conduct VM integration and test in both MQ-25 and MQ-8. Concurrently, CCS, Increment II will continue to develop MM/MP capabilities to meet platform operational requirements with the first release planned for mid-2020.

STRIKE WEAPONS PROGRAMS

Cruise Missile Strategy

The Department's Cruise Missile Strategy (CMS) provides for the development of stand-off attack capabilities from air, surface, and undersea platforms against both Surface and Land Domain targets. The key CMS tenets are:

1. Maintain and upgrade legacy cruise missiles.
2. Pursue advanced near/mid-term capabilities.
3. Plan and develop next generation integrated solutions.

Tactical Tomahawk (TACTOM) Block IV Cruise Missile

The FY 2019 President's Budget requests $282.4 million in RDT&E, $98.6 million in Weapons Procurement Navy (WPN) and $92.9 million in OPN.

RDT&E will be used for development/test of navigation and communications upgrades to improve TACTOMs performance in Anti-Access/Area Denial environments (A2/AD), development/test of Maritime Strike Tomahawk (MST), development/test of a Global Positioning System M-Code capability, development/test of the Joint Multiple Effects Warhead System and Fuse, and associated Tactical Tomahawk Weapon Control System (TTWCS) and Tomahawk Mission Planning Center (TMPC) updates that support all upgrades and address usability, interoperability and information assurance mandates.

WPN is required for the transition from a missile production to a missile recertification phase, production line shutdown, procurement of 112 A2/AD kits and completion of 87 missile recertifications.

OPN is required for procurement and installation of TMPC and TTWCS hardware/software modifications to address evolving security requirements, critical program information protection, obsolescence updates, and modern computing architecture improvements.

Offensive Anti-Surface Warfare (OASuW) Increment 1 (Long Range Anti-Ship Missile (LRASM))

OASuW Increment 1 (LRASM) will provide Combatant Commander's the ability to conduct ASuW operations against high-value surface combatants protected by Integrated Air Defense Systems with long-range Surface-to-Air-Missiles and deny adversaries sanctuary of maneuver against 2018-2020 threats. The program is scheduled to achieve Early Operational Capability on the Air Force B-1B by the end of FY 2018 and Navy F/A-18E/F by the end of FY 2019.

The FY 2019 President's Budget request $143.1 million in RDT&E for LRASM development and testing and $81.2 million in WPN to purchase 25 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 to be developed via full and open competition. To inform the long-term path forward, the DoN will leverage Next Generation Land Attack Weapon (NGLAW) AoA results to inform the required ASuW capabilities. Due to Increment 2 budget marks, Navy requests support for an incremental upgrade to LRASM to bridge the

gap until an OASuW Increment 2 program of record can be established. Increment 2 IOC is now planned for the FY 2028-2030 timeframe.

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. NGLAW initially complements, and then eventually replaces the Tomahawk Weapon System. IOC is planned for the 2028-2030 timeframe (est.). The FY 2019 budget requests $16.9 million to begin the transition of NGLAW to a program of record.

Sidewinder Air-Intercept Missile (AIM-9X)

The FY 2019 President's Budget requests $40.1 million in RDT&E and $78.3 million in WPN. RDT&E will be applied toward the Engineering Manufacturing Development of critical hardware redesign driven by obsolescence; developmental test of System Improvement Program missile software (Version 9.4); and design and development of Insensitive Munitions (IM) improvements (Joint Chiefs of Staff IM mandate).

WPN funding is requested to procure a combined 192 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 2019 President's Budget requests $32.5 million in RDT&E for continued software capability enhancements and $212.2 million in WPN for 141 All-Up-Rounds and associated missile/missile-related hardware.

RDT&E resources support the development and test of an Electronic Protection Improvement Program and a System Improvement Program to counter emerging electronic attack threats.

Small Diameter Bomb II (SDB II)

The FY 2019 President's Budget requests $104.4 million in RDT&E for continued development/test of the SDB II weapon, the BRU-55 bomb rack modification (required for IOC onboard F/A-18E/F aircraft), and the BRU-61 bomb rack modification (required for the F-35B/C platform launch). The DoN also requests $91.3M in WPN to procure 750 All-Up-Round weapons.

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

The FY 2019 President's Budget requests $6.3 million of RDT&E for AARGM Foreign Material Assessment; $15.3 million for AARGM Global Positioning System M-Code development, AARGM Derivative Program transition, and Block 1 follow-on development; $99.2 million of RDT&E for AARGM Extended Range development; and $188.0 million of WPN for production of 257 AARGM Block 1 modification kits for integration into All-Up-Rounds and Captive Training Missiles.

Joint Air-to-Ground Missile (JAGM)

The FY 2019 President's Budget requests $6.8 million in RDT&E to complete JAGM integration onto the Marine Corps AH-1Z platforms and $24.1 million in WPN to procure 71 tactical missiles and four captive air training missiles.

Advanced Precision Kill Weapon System II (APKWS II)

APKWS II has become a weapon of choice in current operations as it provides an unprecedented precision guidance capability to the DoN rocket inventories, thereby significantly improving accuracy and minimizing collateral damage.

The FY 2019 President's Budget requests $108.8 million in PANMC for procurement of 3,686 APKWS II guidance section kits for use on both rotary-wing and fixed-wing platforms.

Direct Attack Weapons and General Purpose Bombs

Fully funding General Purpose Bombs and the Joint Direct Attack Munition (JDAM) line items are critical to building the DoN's direct attack weapons inventory. In the last forty-two months of ongoing contingency operations DoN aircraft have expended nearly two times the number of 500 lb JDAM kits than we have taken delivery of during the same period.

The FY 2019 President's Budget requests $142.4 million in PANMC for Direct Attack Weapons and General Purpose Bombs and an additional $180.9 million to procure 7,594 JDAM kits to enhance readiness and prepare for future contingencies.

CONCLUSION

Naval Aviation continues to operate forward – fully prepared for conflict in the full range of military operations while managing near-term service-life, mid-term capability improvements and long-term investments in research and development for delivery of future capabilities. We are building and sustaining a lethal, resilient force through balanced investments across readiness, capability and capacity. Naval Aviation is actively pursuing and seizing innovation and advantage wherever it can as we implement our vision to provide the right capability in the hands of the warfighter, on schedule, and in the most affordable manner possible.

Addendum A

SAFETY
(Part 1 of 2)

Physiological Episodes (PE)

All Navy senior leadership views the occurrence of Physiological Episodes (PE) in our tactical aircraft and trainers as our number one aviation safety priority until we fully understand all causal factors and mitigate PEs as a risk to flight operations. To date, we have identified multiple interrelated causal factors but the entirety of the root cause(s) of physiological episodes remains unidentified. Mitigation efforts currently in place, to include software modifications, personnel education, and equipment changes are positively affecting the PE rate for all Type/Model/Series aircraft but most notably in T-45s. With these mitigations, Naval Aviation is currently meeting operational requirements and personnel are working in an operational environment with an acceptable level of risk.

For our T-45 aircraft we have reduced the overall PE rate substantially with over 30,000 flight hours flown and only seven minor events since the return to flight. Five of the seven cases post return-to-flight were attributed to human factors; in all T-45 cases, negligible contaminants were found in the monitoring devices, all well below Occupational Safety and Health Administration standards. Beyond mitigating the identified flow problem from the engine, we are integrating an Automatic Backup Oxygen System (ABOS) to improve oxygen generating system performance overall.

In our F/A-18 aircraft, we continue to implement changes that are improving the Environmental Control System, increasing system stability of failure modes and improving the cockpit environment for our aviators. More work remains to be done, but mitigation and redesign efforts are producing positive results in all FA-18 variants. We are collaborating across the DoD to leverage research efforts to help characterize the cockpit environment to ensure we reach a long-range, holistic solution rather than interlaced mitigations in both current and future aircraft. We have investigated every line

of inquiry recommended by the NASA report to include measuring breathing gas quality at the mask. We are drafting a request for proposal for a new MIL-STD-3050 compliant On Board Oxygen Generating System (OBOGS) concentrator designed to replace the existing well performing but less capable concentrator currently in the F/A-18 and EA-18 aircraft. This effort will provide digital data logging of performance, increased reliability and oxygen scheduling in compliance with the MIL-STD. The replacement OBOGS concentrator will be the first in the DoD inventory to comply with the MIL-STD that was created in 2015.

We have also assigned a Flag Officer to oversee a Physiological Episodes Action Team (PEAT). Together, our engineers, industry partners, physiologists and outside support from groups as diverse as the National Aeronautics and Space Administration and Naval Medical Research Units are working diligently to find a solution to the physiological episodes issue.

RDML Joyner, the Department's PEAT lead, recently testified to the House Armed Services Committee on February 6, 2018. Her formal statement provides a comprehensive update on all PE efforts to-date and the hearing transcript provides additional relevant data. Both can be found at: https://armedservices.house.gov/legislation/hearings/addressing-physiological-episodes-fighter-attack-and-training-aircraft-0

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 2015 through March 2018 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
FY16	1,098,519	18	1.64	26	2.37	216	19.66
FY17	1,072,156	25	2.33	33	3.08	242	22.57
FY18	500,414	8	1.6	22	4.40	114	22.78

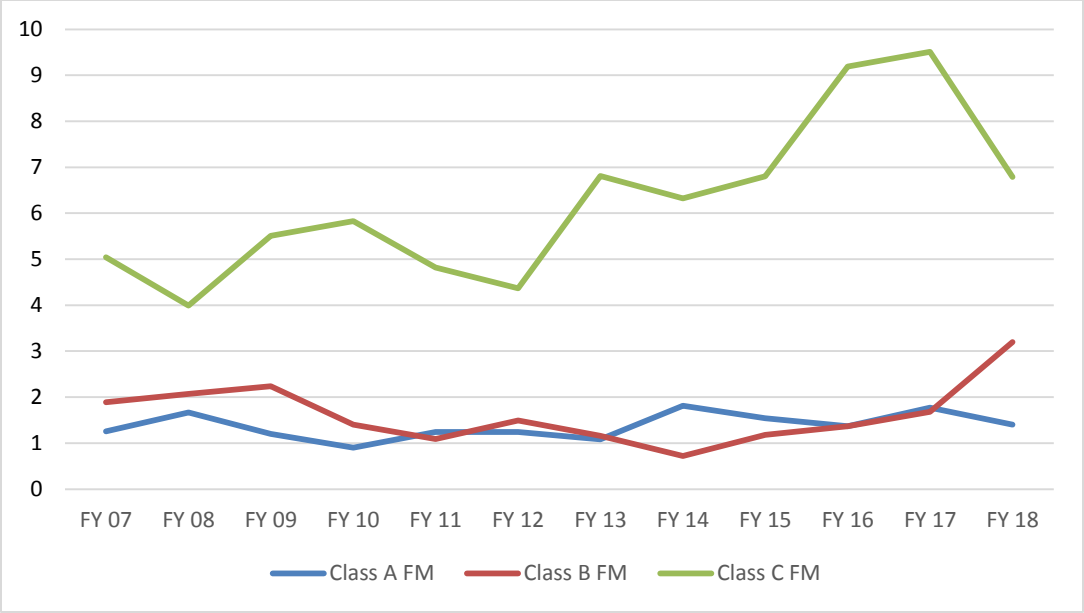
The most recent (FY 2017-26 Mar 2018) DoN flight Class A mishaps include:

- 19 Mar 2018: (MCAS Futenma, Okinawa) CH-53E main rotor damper failed in flight and caused significant damage. No injuries.
- 14 Mar 2018: (NAS Key West, FL) F/A-18F crashed on short final, single engine. Two fatalities.
- 11 Dec 2017: (Tinker AFB, OK) E-6A struck birds during descent, leading to number 4 engine flameout.
- 04 Dec 2017: (NAS Fallon) F/A-18A right leading edge flap departed aircraft in flight and hit the vertical stabilizer.
- 22 Nov 2017: (Philippine Sea) C-2A ditched while inbound to CVN with 11 onboard. Three fatalities.
- 11 Oct 2017: (Futenma MCAS, Japan) CH-53E engine fire in flight, emergency landing. No injuries.
- 01 Oct 2017: (Monroe County, TN) T-45C crashed on low-level training route. Two fatalities.
- 28 Sep 2017: (Syria) MV-22B crashed on landing during support mission.
- 12 Aug 2017: (Bahrain) F/A-18E departed runway during landing after a ship to shore divert due to an engine malfunction. Pilot ejected. No injuries.
- 09 Aug 2017: (25 Miles South of Key West, FL) F-5N went down over water. Pilot ejected safely.
- 05 Aug 2017: (15 nm off NE Australia IVO Shoal Water Bay) MV-22B struck LPD flight deck on final approach and then crashed into water. Three personnel are missing and presumed deceased. 23 recovered.
- 05 Aug 2017: (North Island NAS, CA) F/A-18F struck round down with right horizontal stabilator upon landing. Diverted successfully.
- 16 Jul 2017: (Bay of Bengal) F/A-18F engine borescope plug backed out in flight causing hot air to burn to engine bay and aircraft skin.
- 10 Jul 2017: (Indianola, MS) KC-130T crashed on logistics flight from Cherry Point to El Centro. 16 fatalities.
- 27 Apr 2017: (Off the Coast of Guam) MH-60R collided with water on initial takeoff from ship. No injuries.

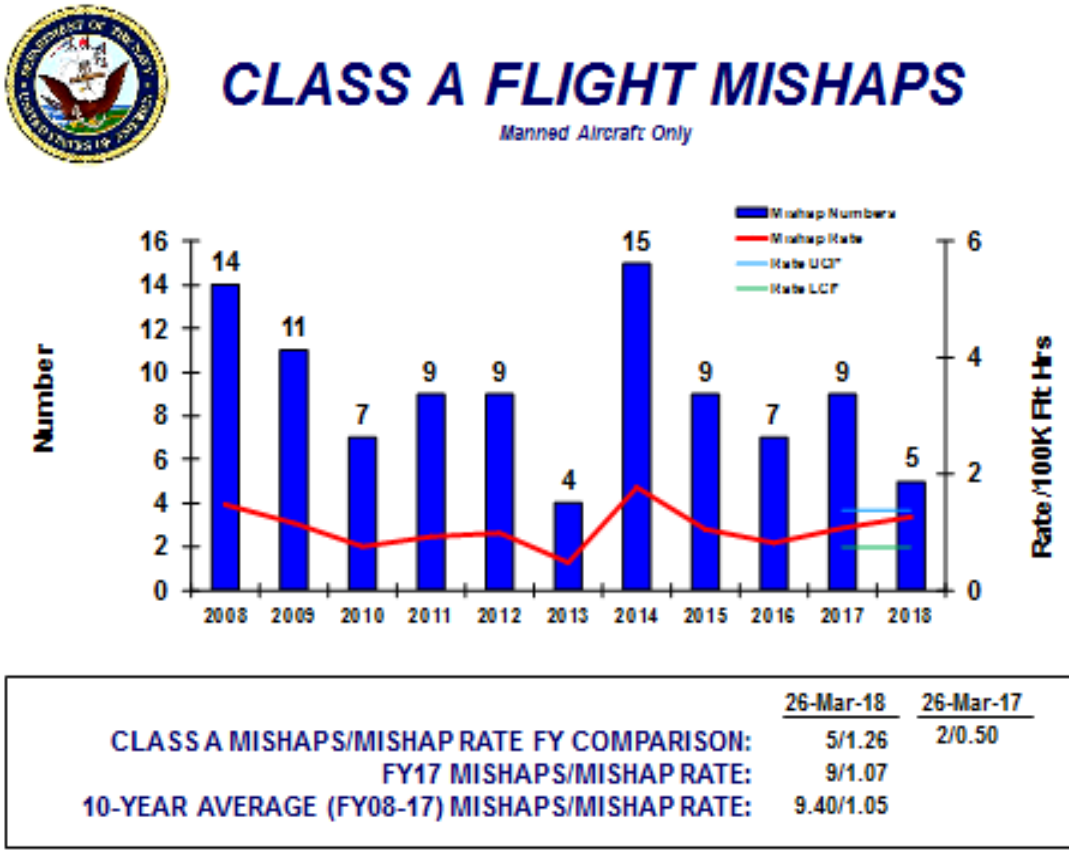
- 21 Apr 2017: (Philippine Sea) F-18E lost on approach to landing on carrier. Pilot ejected without injury prior to water impact.
- 05 Apr 2017: (Yuma, AZ) CH-53E landed hard and rolled on day training flight. Crew of five uninjured.
- 28 Mar 2017: (El Centro NAF) HH-60H main rotor blades contacted tail rotor driveshaft on landing.
- 17 Jan 2017: (NAS Meridian, MS) T-45 crashed following a BASH incident on takeoff. Both crewmembers ejected. No fatalities.
- 12 Dec 2016: (Off the Coast of Okinawa, Japan) MV-22B attempted a precautionary emergency landing (PEL) to dry land but crash landed in shallow water. Crew of five evacuated with injuries.
- 07 Dec 2016: (Off the Coast of Iwakuni MCAS, Japan) F/A-18C crashed into the water while conducting a night mission. One fatality.
- 21 Nov 2016: (Upper Mojave Desert Region) F/A-18F struck a tree while instructor pilot was conducting a currency flight event. Returned to base safely. No injuries.
- 09 Nov 2016: (Off the Coast of San Diego) Two F/A-18As were conducting basic flight maneuvers and had a mid-air collision. One aircraft crashed in the water. Pilot ejected successfully. One aircraft landed with significant damage.
- 27 Oct 2016: (MCAS Beaufort, SC) F/A-35B had an inflight weapons bay fire followed by an uneventful landing. No injuries.
- 25 Oct 2016: (Twentynine Palms, CA) F/A-18C crashed on final approach. Pilot ejected successfully. No injuries.
- 20 Oct 2016: (Yuma, AZ) CH-53E main rotor contacted building causing damage to the aircraft.

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

- 21 Feb 2018: (MCAS Camp Pendleton, CA) During aircraft startup, aerial observer was struck by tail rotor. One fatality.
- 17 Aug 2017: (NW of San Clemente Island) MH-60R lost SONAR transducer at sea. (FRM)
- 11 Jul 2017: (New River MCAS, NC) Maintenance personnel struck by lightning on the flight line while working on MV-22B. One fatality. Two others were treated and released. (AGM)
- 25 Jun 2017: (MCAS Miramar, CA) Two Marines injured and F/A-18A damaged after flammable material in drip pan caught fire. (AGM)
- 19 Jan 2017: (NAS Norfolk, VA) Three E-2C aircraft damaged in an engine oil related event. (AGM)
- 18 Dec 2016: (Kadena AFB, Japan) Tow bar separation resulted in aircraft/tow collision with damage to nose gear and lower fuselage of P-8A. (AGM)
- 15 Dec 2016: (NAS Whidbey Island, WA) Canopy on EA-18G exploded/jettisoned resulting in severe injuries to two personnel. (AGM)

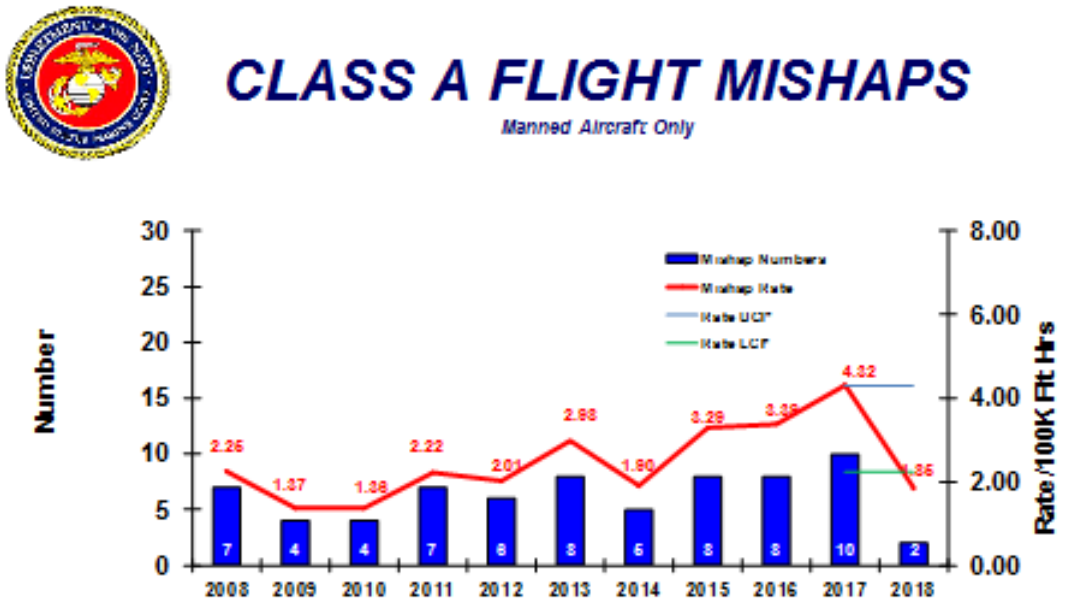


DoN Historical Mishap Rate Trend per 100K Flight Hours per Mishap Class (As of 26 Mar, 2018)



	26-Mar-18	26-Mar-17
CLASS A MISHAPS/MISHAP RATE FY COMPARISON:	5/1.26	2/0.50
FY17 MISHAPS/MISHAP RATE:	9/1.07	
10-YEAR AVERAGE (FY08-17) MISHAPS/MISHAP RATE:	9.40/1.05	

Class A Manned Flight MISHAP Historical Data for U.S. Navy



	26-Mar-18	26-Mar-17
CLASS A FM/FM RATE FY COMPARISON:	2/1.85	6/5.72
FY17 MISHAPS/MISHAP RATE:	10/4.32	
10-YEAR AVERAGE (FY08-17) MISHAPS/MISHAP RATE:	6.70/2.51	

Class A Manned Flight MISHAP Historical Data for U.S. Marine Corps

UCI = Upper Confidence Interval LCI = Lower Confidence Interval
Rate values above the UCI or below the LCI infer a statistically significant change is probable. This is only an indicator. Significance cannot be determined until end-of-year. Values between the UCI and LCI infer that nothing significant has occurred to increase or decrease mishap rate.

End of Addendum A