NOT FOR PUBLICATION UNTIL RELEASED BY THE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

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'S STRIKE FIGHTER PROGRAMS

February 4, 2016

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INTRODUCTION

Mr. Chairman, Ranking member Sanchez 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) Strike Fighter programs. This statement addresses the DoN Strike Fighter requirement as well as efforts to recapitalize the force. Appendix A includes an overview of related physiological episodes and aircraft mishap data.

While your invitation to appear before the committee is focused on DoN Strike Fighter issues, we note that Aviation readiness is in a precarious position that extends well beyond the Strike Fighter force structure – it is particularly acute in the United States Marine Corps. Marines are flying, on average, 58 percent of the required flight time necessary to be ready for the Nation's call.

STRIKE FIGHTER INVENTORY MANAGEMENT

The Department remains challenged with end of life planning for F/A-18A-D and AV-8B aircraft that reach the end of their service life before replacement aircraft can be fully delivered into service. To keep pace with the issue and provide high-fidelity analytical rigor to decision makers, DoN transitioned to the Naval Synchronization Tool (NST) in 2014. This inventory modeling and forecasting tool better informs the Strike Fighter Inventory Management (SFIM) planning and the budgetary programming process.

The Strike Fighter inventory should be viewed in two separate and distinct phases. The near term challenge is managing a DoN TACAIR force that has been reduced in capacity through a combination of reduced Strike Fighter aircraft procurement, higher than planned TACAIR utilization rates, under resourcing sustainment and enabler accounts resulting in inadequate availability of spare parts, and F/A-18A-D depot production falling short of the required output. As a result of aggressive efforts instituted in 2014 across the Department to improve depot throughput and return more aircraft back to service, fiscal year (FY) 2015 depot throughput improved by 44 percent as compared to FY14, returning to pre-sequestration levels of production. TACAIR aviation depots are expected to continue to improve productivity through

2017, and fully recover the backlog of F/A-18A-D aircraft in 2019 at which time the focus will shift toward F/A-18E/F service life extension, F-35 repair, and the rest of the DoN aircraft inventory. In a similar effort to increase Harrier aircraft availability, the Department conducted a Harrier Independent Readiness Review (HIRR) which identified a need for changes in the Harrier sustainment plan to achieve required flight line and inventory readiness. This year, with Congress' support, the Department is implementing these changes to return Harrier readiness to required levels.

In the far term, the Strike Fighter inventory is predominantly affected by new aircraft procurement – FA-18E/F and F-35. Combatant Commander (COCOM)-driven operations and Fleet Readiness Training Plan (FRTP) requirements are driving an increased Strike Fighter utilization rate that currently outpaces procurement. Mitigation strategies, such as reducing utilization on current aircraft, are being examined by Commander, Naval Air Forces. Nonetheless, the DoN Strike Fighter force continues to meet Global Force Management (GFM) operational commitments. We anticipate inventory pressure to remain relatively constant through the future as we experience peak depot inductions of F/A-18A-D aircraft reaching 8,000 hours High Flight Hour (HFH) service life extension inspections, repairs and modifications, and later as depot inductions increase significantly due to F/A-18E/F service life extensions. The continued efforts of the Naval Aviation Enterprise (NAE) will define the necessary actions required to manage the end of life of aging F/A-18A-D and AV-8B aircraft, address further discovery of greater than expected fatigue and corrosion issues, maintain their operational relevancy and ensure required availability of these aircraft until fully replaced by the Joint Strike Fighter (JSF).

The DoN Program of Record (POR) includes 680 F-35 aircraft. The Navy F-35C POR is 260 aircraft. The total Marine POR is 420 aircraft – 353 F-35Bs and 67 F-35Cs. The Navy and Marine Corps will continue to modify transition plans to adjudicate F-35 procurement changes. Sustainment and modernization funding will be required to maintain the relevant operational capability of the F/A-18A-F and the AV-8B throughout the transition to the F-35. Given the implications for the Department of Defense as a whole, the Under Secretary of Defense for

Acquisition, Technology & Logistics is also examining the long term health and viability of the TACAIR industrial base in depth.

STRIKE FIGHTER FORCE STRUCTURE

The 1,240 aircraft Strike Fighter force is the projected DoN inventory needed to support the anticipated operational demand through the 2030 timeframe. The Navy inventory requirement of 820 aircraft supports 40 active duty Strike Fighter squadrons composed of 440 aircraft (mix of 10-12 aircraft per squadron), and two reserve squadrons with 22 total aircraft assigned. In order to maintain the operational aircraft, support aircraft are required for aviator training, flight test, attrition reserve and the depot pipeline. This inventory projection is estimated based on historical averages and assumes 100 percent squadron entitlement. Through detailed analysis, inspections, and structural repairs, as required, the DoN has been successful in achieving 8,000 flight hours per F/A-18A-D aircraft, 2,000 flight hours beyond the original designed service life, and is pursuing a strategy to go as high as 10,000 flight hours on select aircraft. The inventory projection also assumes a service life extension for F/A-18E/F aircraft to 9,000 flight hours from the design life of 6,000 flight hours.

The Navy's F-35C TACAIR requirement is 260 aircraft in 18 active squadrons and one training squadron. The F-35C capabilities complement the F/A-18E/F and enhance the overall carrier-based war-fighting capabilities. This force structure supports the operational demand per the Global Force Management Allocation Plan (GFMAP) and projected aircraft carrier deployments. The Marine Corps F-35B/C TACAIR requirement is 420 aircraft in 18 active, two reserve, and two training squadrons. Integral to our current force structure reductions, our tactical aviation squadrons were restructured to optimize the support they provide to the Marine Air Ground Task Force (MAGTF). The program of record for USMC F-35 includes four F-35C squadrons that are capable of being integrated with Navy carrier air wings and fair share contribution of F-35C pilots and maintainers to the Fleet Replacement Squadrons (FRS).

F/A-18A-D Hornet:

The F/A-18A-D was designed for, and has achieved, a service life of 6,000 flight hours, performing as expected through their design life. Service life management of this aircraft intends to extend this platform beyond its designed 6,000 flight hours, achieving 8,000 flight hours per aircraft with select aircraft extended to 10,000 flight hours. Continued investment in the Service Life Extension Program (SLEP), the High Flight Hour (HFH) inspection program, and Air Systems Support (i.e. Program Related Engineering and Program Related Logistics) is crucial to our flight hour extension strategy. In order to maintain war-fighting relevancy in a changing threat environment, we will continue to procure and install advanced systems such as Digital Communication System Radios, Joint Helmet-Mounted Cueing Systems (JHMCS) and the Night Vision Cueing and Display (NVCD), High Order Language Mission Computers, ALR-67v3, ALQ-214v5, Multi-Function Information Distribution System-Joint Tactical Radio System (MIDS-JTRS), APG-73 radar enhancements, Advanced Targeting Forward looking Infrared (ATFLIR) upgrades, and LITENING targeting pods for the Marine Corps on selected F/A-18A-D aircraft.

Although the F/A-18A-D is out of production, a portion of the existing inventory of 610 Navy and Marine Corps aircraft is scheduled to remain in service through 2031. The DoN will continue to meet Navy operational commitments with F/A-18A-D until 2026 for active squadrons, 2029 for Marine Corps active and reserve squadrons, and through 2034 for Navy reserve squadrons. Using the Structural Life Management Program, fleet managers monitor and maintain the health of the legacy F/A-18A-D fleet through analyses of TACAIR inventories and the management of usage rates at the squadron level. Ninety-one percent of the F/A-18A-D fleet has over 6,000 flight hours and 19 percent (114 aircraft) have flown more than 8,000 flight hours. The highest flight hour airframe has attained over 9,575 hours and is currently conducting forward deployed operations.

The F/A-18A-D aircraft have been, and will continue to be, maintained operationally relevant through upgrades. The F/A-18A-D Service Life Assessment Program (SLAP) showed that the airframe can be flown beyond 8,000 hours and up to 10,000 hours with a combination of further

inspections and airframe modifications (engineering change proposals (ECPs)) to maintain airworthiness certification. The inspection results to date have matched the SLAP data. Depot throughput of these aircraft is complicated by the on-going discovery of corrosion, which is difficult to predict, introducing unplanned work in inducted airframes. Depot leaders have developed an aggressive plan to design and develop standard repairs for corrosion-induced work to better manage the unplanned workload during depot events.

The F/A-18A-D SLEP effort has featured a phased approach since inception, developing ECPs and inspection criteria for the most critical airframe requirements first to ensure timely fielding of priority inspections and modifications. These efforts reduce risk in airworthiness and cost while allowing for future program trade space to mitigate potential program-wide delays. To meet fleet requirements prior to the completion of the initial phases of SLEP, the F/A-18A-D airframe requires a suite of High Flight Hour (HFH) inspections designed to extend the service life beyond 8,000 flight hours. HFH inspections are required to assess the material condition and airworthiness of aging F/A-18A-D aircraft to meet resourcing requirements as aircraft reach 8,000 hours. The HFH suite continues to be revised as a result of on-going SLAP and SLEP analysis. To date, 171 HFH inspections have been successfully completed with 118 HFH inspections currently in-work. Fleet utilization of aircraft at high rates are pressurizing depot workload as increasing numbers of F/A-18A-D aircraft reach 8,000 flight hours, requiring extensive depot time to inspect, repair, and extend service life.

The Department is conducting SLEP/HFH inspections/repairs at seven locations: NAS Lemoore, CA; NAS North Island: San Diego, CA; NAS Jacksonville, FL; Boeing: Cecil Field, Jacksonville, FL; MCAS Miramar: San Diego, CA; MCAS Beaufort, SC; and NAS Oceana: Virginia Beach, VA. While less complex SLEP modifications can be incorporated at all sites, major SLEP modifications are done concurrently with major depot events.

F/A-18E/F Super Hornet:

The F/A-18E/F Super Hornet will be numerically the predominant aircraft in the Navy's carrier air wing Strike Fighter force through 2035. The F/A-18E/F began Full Rate Production (FRP) in

2000. To date, 99 percent of the total procurement objective has been delivered (562 of 568 aircraft). Continued investment funds capability upgrades with a focus on completing both Passive and Active kill-chains, significantly improving the lethality relevance of the carrier air wing. The Super Hornet modernization plan features an incremental approach to incorporate new technologies and capabilities, to include Digital Communication System Radio, MIDS - Joint Tactical Radio System, JHMCS, ATFLIR with shared real-time video, Accurate Navigation, Digital Memory Device, Distributed Targeting System, Infrared Search and Track (IRST) and continued advancement of the APG-79 Active Electronically Scanned Array (AESA) Radar.

The F/A-18E/F fleet has flown approximately 44 percent of the total flight hours available within the 6,000 hour limit design life. This fleet flight hour capacity will not be adequate to meet operational commitments out to the 2040's. As a result, Navy is designing an F/A-18E/F Service Life Assessment Program (SLAP) to determine what it would take to extend the airframe service life beyond 6,000 flight hours. Like the F/A-18A-D Hornet, the Super Hornet program is executing a three-phased SLAP which commenced in 2008 and is expected to last through 2024. The goal is to analyze fleet actual-usage versus structural test data to design a program to extend F/A-18E/F service life from 6,000 flight hours to 9,000 flight hours via a follow-on Service Life Extension Program (SLEP). The initial phases of the F/A-18E/F SLEP began in 2014 to develop and produce engineering change proposal kits to upgrade life-limited locations on the aircraft that are revealed by SLAP analysis.

The Service Life Management Plan philosophy has been applied to the entire F/A-18 fleet since 2007 to facilitate optimization and alignment of Fatigue Life, flight hours and total landings, thereby better matching aircraft service life to fleet requirement. The aircraft are managed by bureau number by the staff of Commander, Naval Air Forces (CNAF). The F/A-18E/F SLAP effort incorporates lessons learned from the F/A-18A-D analysis and was started sooner in the aircraft life cycle than the F/A-18A-D SLAP. The F/A-18E/F SLAP also takes advantage of completing a third lifetime of test cycles on certain test articles providing more detailed information on high fatigue areas earlier in the program than the F/A-18A-D.

EA-18G Growler:

The EA-18G Growler is a critical enabler for the joint force, bringing fully netted warfare capabilities to the fight that provides unmatched electromagnetic spectrum agility in an Electromagnetic Maneuver Warfare (EMW) environment. To date, 114 aircraft have been delivered, representing 72 percent of the funded inventory objective. Initial operating capability (IOC) occurred in September 2009 and full rate production (FRP) was approved in November 2009. The first EA-18G squadron deployed to Iraq in an expeditionary role in November 2010 in support of Operation NEW DAWN, and subsequently redeployed to Italy on short notice in March 2011 in support of Operation UNIFIED PROTECTOR. The first carrier-based EA-18G squadron deployed in May 2011. Since their initial deployment, Growlers have flown more than 2,300 combat missions, have expended approximately 16 percent of the 7,500 flight hour life per aircraft, and are meeting all operational commitments. Electronic attack capabilities, both carrier-based and expeditionary, continue to mature with development of the Next Generation Jammer (NGJ), which is scheduled to replace the legacy ALQ-99 Tactical Jamming System.

The recent addition of seven aircraft will extend deliveries to FY18, which is expected to fulfill Navy requirements for carrier-based airborne electronic attack and expeditionary EA-18G squadrons. A number of additional EA-18Gs, above the funded procurement objective of 160, is still under consideration as the Navy is currently exploring solutions that optimize the Growler procurement plan to support an AEA force structure to meet the joint requirement.

AV-8B Harrier:

The current Marine Corps inventory consists of 131 AV-8B Harrier aircraft. This includes 34 Night Attack and 79 Radar aircraft, 16 TAV-8B trainers, one Day Attack upgrade, and one Center for Naval Aviation Technical Training (CNATT) maintenance trainer. These aircraft support six operational squadrons of 14 aircraft each (PMAA of 84). The inventory decline is the result of September 2012 combat losses at Bastion Airfield, Afghanistan. This attack accounts for the loss of eight AV-8Bs; six destroyed, two damaged. To date, the AV-8B fleet is averaging 12 aircraft out-of-reporting for Planned Maintenance Interval (PMI) and special re-

work, with a five-year average of 18.1 percent per year. Most importantly, the Harrier has suffered from inadequate supply support, driving down the number of aircraft that can train, deploy, and support our Marines.

The AV-8B was originally designed as a 6,000-hour airframe with expected service life through 2012. In 2010, the Department transitioned to a Fatigue Life Expended (FLE) model that more accurately measures actual stress history on individual airframe components, enabling the airframe to fly beyond 6,000 hours. Fleet average for all three single-seat variants of the AV-8B Harrier is 34.6 percent FLE; there is sufficient airframe life left in these aircraft to reach their eventual end of service. Sub-contractors and vendors divested manufacturing lines of AV-8B material in anticipation of the 2012 sundown. Delays in F-35 procurement, coupled with F/A-18A-D out-of-reporting challenges led to changes in the Marine Corps' TACAIR transition order shutting down one FA-18 squadron early and extending the service of the AV-8B to mitigate a growing USMC TACAIR inventory shortfall.

Due to component obsolescence concerns and supply shortfalls, the Department purchased 57 GR-9 aircraft, 38 MK-107 engines, parts supply, and support equipment from the United Kingdom in 2011. The GR-9 buy was meant to fill a supply gap allowing NAVSUP immediate access to supply inventory, to develop long term sustainment strategies and give industry time to re-develop parts production lines to support the AV-8B until transition to the F-35 is complete. To date, over 68,000 parts exceeding $51 million have been used from the GR-9 purchase. This decision had an immediate impact in reducing supply backorders. However, a reduction in demand signal from the GR-9 and other lifetime-type buys may cause additional reduction in sub vendors and supply contractors unless carefully managed.

The AV-8B continues to be in high demand deploying in support of COCOM requirements and operational contingencies. Each Marine Expeditionary Unit (MEU) deploys with embarked AV-8Bs. AV-8B and F/A-18A-D squadrons alternate in support of Special Purpose Marine Air-Ground Task Force (SPMAGTF) deployments. Harriers deploy with 10-aircraft squadron sized units, with their remaining six aircraft at sea with a MEU. They are flying and leading joint and coalition strikes in Iraq and Syria today.

The AV-8B, equipped with LITENING targeting pods and a video downlink to ROVER ground stations, up to six precision strike weapons, and beyond visual range air-to-air radar missiles, has continued to be a proven, invaluable asset for the MAGTF and joint commanders across the full spectrum of operations. During the first half of FY15, the AV-8B received the H6.1 Operational Flight Program (OFP) enabling full integration of the Generation 4 LITENING targeting pod. During 2015, the program continued work on the H6.2 Operational Flight Program, which will integrate the initial Link 16 message sets. Additionally, this OFP will integrate Federal Aviation Administration (FAA) compliant RNP/RNAV capability and correct additional software deficiencies identified through combat operations. Work continues on H7.0 OFP as well, which will complete the integration of Link 16. The Airborne Variable message Formal (VMF) terminals will be installed in AV-8Bs to replace the current digital-aided close air support (CAS) technology and additional efforts include tactical datalink and sensor improvements in support of operational contingencies until transition to the F-35. As an out-of-production aircraft, the AV-8B program will continue its focus on sustainment efforts to mitigate significant inventory challenges, maintain airframe integrity, achieve full FLE, and address reliability and obsolescence issues of avionics and subsystems.

F-35 Lightning II:

The future of DoN TACAIR relies on a combined total of 680 F-35B and F-35C fifth generation aircraft that are part of the larger joint F-35 program. More than just the next fighter, the F-35 brings unprecedented low observable technology, modern weaponry, and electronic warfare capability to the Navy and Marine Corps. Marine Fighter Attack Squadron 121 achieved the world's first operational capability last summer with the F-35B, and will deploy within the next year to defend the Nation's interests abroad. Marine Fighter Attack Squadron 211 will stand up in the months ahead. The Navy will achieve Initial Operational Capability with the F-35C carrier variant in August 2018, the Marines operational in 2020, and together replace our aging aircraft inventory with the greatest practical speed.

The Marine Corps operates the STOVL variant of the F-35, the F-35B. The fielding of the F-35B continues to make excellent progress due to the combined efforts of the Department,

industry, and Congress. Critical Military Construction (MILCON) at our bases and stations, both at home and overseas is underway to support the fifth generation capability, and the men and women who operate and maintain the aircraft are ready. The Department is starting to train with the F-35B at our most advanced weapons schools while exercising the expeditionary capability the STOVL variant in particular represents. The F-35 employs a block upgrade program to usher in new and advanced war-fighting capabilities. From strike, to CAS, to counter air, escort, and electronic warfare – this machine is the key to our future – empowering our maritime forces to fight from sea bases and expeditionary bases ashore in any clime and place, against any foe. The F-35 is a Strike Fighter the Department needs, although we must get the spare parts posture right, along with the rest of the supporting logistics to take full advantage the aircraft's full capability.

CONCLUSION

The Navy and Marine Corps aviation fleet is an agile maritime strike and amphibious power projection force in readiness. Such agility requires that the aviation arm of our naval strike and expeditionary forces remain strong. Mr. Chairman, and distinguished committee members, we appreciate your continued support of our Naval Aviation programs and we look forward to working with you to build the force of the future.

F/A-18 AND EA-18G PHYSIOLOGICAL EPISODES

Physiological events occur when aircrew experience a decrement in performance, or symptoms while airborne related to disturbances in tissue oxygenation, depressurization or other factors present in the flight environment. These phenomena jeopardize safe flight.

As a result of physiological episodes, the F/A-18 Program Office (PMA-265) established a Physiological Episode Team (PET) to investigate the root causes associated with F/A-18A-F and EA-18G aircraft. The core F/A-18 PET is comprised of 17 members of PMA-265, 23 members from the Fleet Support Team (FST) at NAS North Island, 14 members of the FST at MCAS Cherry Point, three members from the Aircrew Oxygen Systems In-Service Support Center, 10 engineers affiliated with NAVAIR 4.3's Environmental Control Systems (ECS) team and 21 members associated with NAVAIR 4.6's Human Systems team. The F/A-18 PET works closely with other program offices, cross-service affiliates and industry partners in evaluating each episode.

The NAVAIR PET is currently addressing hypoxia and decompression sickness (DCS) as the two most likely causes of recent physiological episodes in aviators. As symptoms related to depressurization, tissue hypoxia and contaminant intoxication overlap, discerning a root cause is a complex process. While episodes of decompression sickness typically accompany a noticeable loss of cabin pressure by the aircrew, the cause of most physiological episodes is not readily apparent during flight. Reconstruction of the flight event is difficult with potential causal factors not always readily apparent during post-flight debrief and examination.

Historical data of F/A-18 physiological events prior to May 2010 is based on safety reports. The problem was not well known among pilots at the time, and the low rates prior to 2010 may actually be indicative of low reporting rates rather than low rates of occurrence. The rate per 100,000 flight hours during FY06-FY10 based on safety reports follows:

Date Range	F/A-18A-D	F/A-18E-F	EA-18G
FY06	3.66	2.18	0.00
FY07	1.63	3.73	0.00
FY08	3.72	4.28	0.00
FY09	6.19	8.33	0.00
FY10	4.95	11.96	0.00

In May 2010 PMA-265 established the PET to investigate root causes of physiological episodes while Commander, Naval Air Forces specific reporting procedures to collect more data on the occurrence of an event. The rate per 100,000 flight hours beginning in May 2010 with the implementation of new reporting protocol follows:

Date Range	F/A-18A-D	F/A-18E-F	EA-18G
05/1/2010 - 10/31/2010	12.20	8.98	0.00
11/1/2010 - 10/31/2011	10.90	8.65	5.52
11/1/2011 - 10/31/2012	16.39	23.35	5.42
11/1/2012 - 10/31/2013	21.01	26.23	9.80
11/1/2013 - 10/31/2014	29.54	26.39	15.05
11/1/2014 - 10/31/2015	28.23	28.54	43.57*

* The excessive rate for EA-18G appears to be a statistical anomaly (high variance in a small data set) nevertheless we are taking the discrepancy seriously and investigating any possible root cause.

The process for investigating a physiological episode begins with the submission of data describing the event. Engineers from the Environmental Control System (ECS) FST and the Aircrew Oxygen Systems In-Service Support Center work with the squadron maintenance department to identify which components of the aircraft should be removed and submitted for engineering investigation. The squadron flight surgeon also submits data on the medical condition of the pilot and in-flight symptoms that were experienced.

After completion of the component investigations the incident is examined holistically by members of the engineering teams and Aviation Medical specialists to identify the most likely cause of the incident. Of 273 cases adjudicated by the PET so far, 93 have involved some form of contamination, 90 involved an ECS component failure, 67 involved human factors, 41 involved an OBOGS component failure, 11 involved a breathing gas delivery component failure, and 45 were inconclusive or involved another system failure. Of note some of the events resulted in assignment to more than one category.

A variety of actions have been undertaken to address the occurrence of physiological episodes in the F/A-18. New maintenance rules for handling the occurrence of specific ECS built-in test faults have been implemented throughout the fleet requiring that the cause of the fault be identified and corrected prior to next flight. Mandatory cabin pressurization testing is now performed on all F/A-18A-F and EA-18G aircraft every 400 flight hours and ECS pressure port testing is performed on all F/A-18A-D aircraft every 400 flight hours. Overhaul procedures for ECS components and aircraft servicing procedures have been improved. Emergency procedures have been revised and all pilots now receive annual hypoxia awareness training, and biennial dynamic training using a Reduced Oxygen Breathing Device (ROBD) to experience and recognize hypoxia symptoms while safely on the ground. Many other solutions are in the process of being fielded or under development as well. Internal components of the F/A-18 OBOGS have been redesigned to incorporate a catalyst to prevent carbon monoxide from reaching the pilot and should be installed fleet-wide in the next year. The bleed air detection system is being rerouted to eliminate false alarms that can shut down the ECS system and potentially cause DCS. A new oxygen monitor with increased capability is preparing to enter flight testing and a new component life management strategy for ECS components is also being developed. Studies are in progress to reroute Radar Liquid Coolant discharge ports and replace components that could be sources of contamination within the ECS. Future projects include technology to collect better sample data throughout the ECS and OBOGS, increased capacity for the emergency oxygen bottles, and physiological detection of symptoms.

SUMMARY OF CLASS A, B AND C AVIATION-RELATED SAFETY ISSUES

A summary of all Naval Aviation Class A, B and C aviation-related safety issues, including recent mishaps, trends, and analysis from October 2014 through January 14, 2016 follows. The rates presented are based on mishaps per 100,000 flight hours.

YEAR	Flight Hours	Class A	Class A Rate	Class B	Class B Rate	Class C	Class C Rate
FY15	1,101,692	16	1.45	14	1.27	81	7.35
FY16	295,504	4	1.02	2	0.68	25	8.46

The most recent FY16 DoN flight Class A mishaps include:

- 14 Jan 2016: (Kaneohe Bay, HI) two CH-53E helicopters crashed in water; 12 military fatalities.
- 12 Jan 2016: (Fallon, NV) F/A-18A had engine fire leading to ejection and crash; pilot ambulatory.
- 09 Dec 2015: (Southern California) MV-22B landed short while recovering to LPD; no injuries.
- 21 Oct 2015: (RAF Lakenheath, England) F/A-18C crashed on departure; no civilian casualties; one military fatality.

There are no recent FY16 DoN Class A flight related mishaps (FRM). There is one recent FY16 DoN Class A aviation ground operations mishap (AGM):

- 18 Oct 2015: (WESTPAC) Electrical arcing at vapor cycle power receptacle led to E-2C fire in the hangar bay; no injuries.

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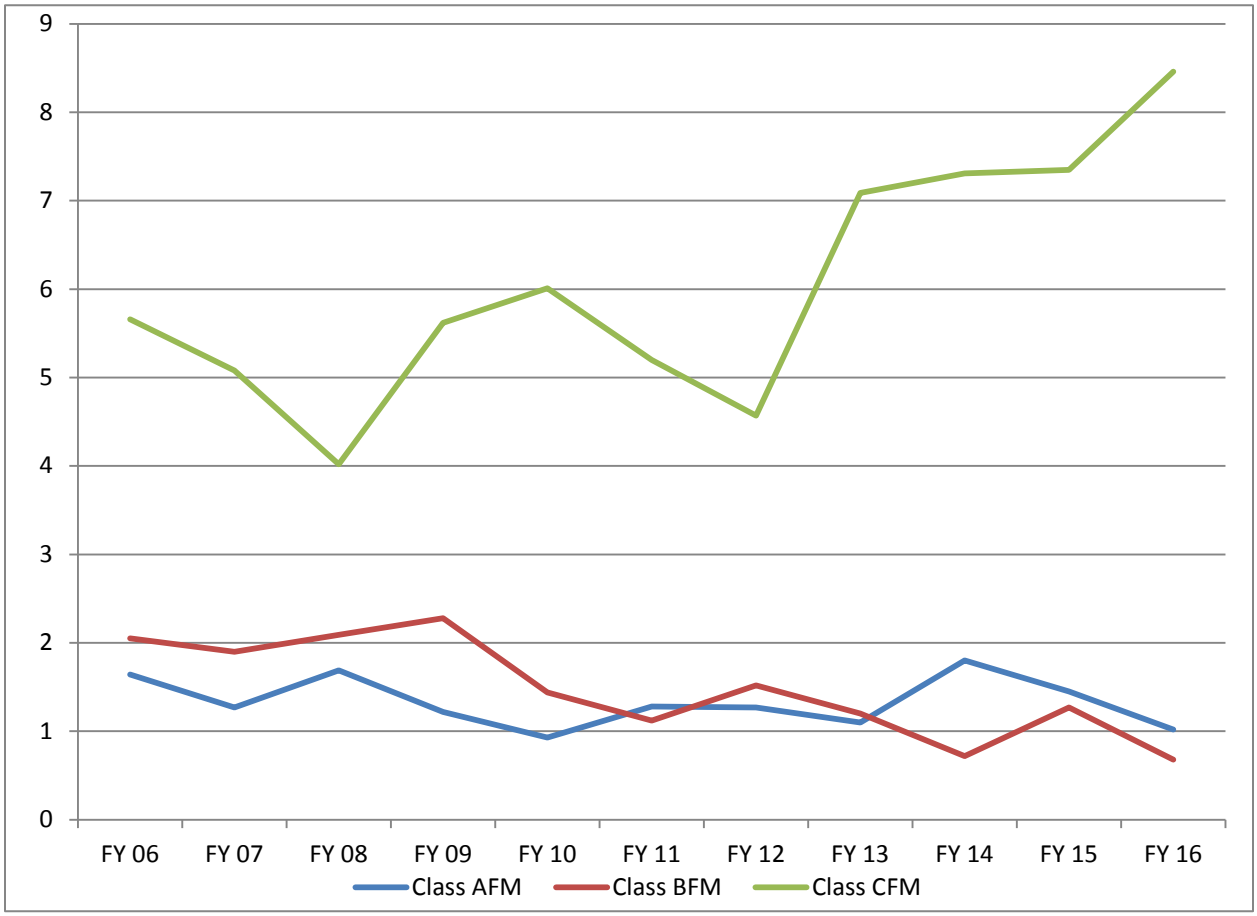
DoN Historical Mishap Rate Trend per 100K Flight Hours per Mishap Class
(As of January 14, 2016)



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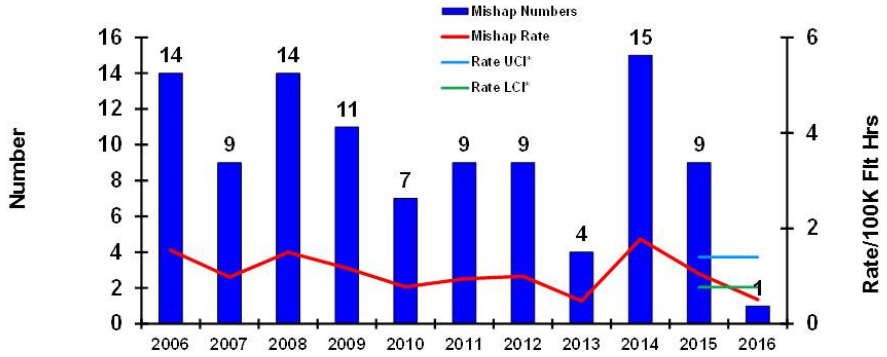
CLASS A FLIGHT MISHAPS

Manned Aircraft Only



	14-Jan-16	14-Jan-15
CLASS A MISHAPS/MISHAP RATE FY COMPARISON:	1/0.51	2/0.88
FY15 MISHAPS/MISHAP RATE:	9/1.05	
10-YEAR AVERAGE (FY06-15) MISHAPS/MISHAP RATE:	10.10/1.12	

*see last slide for definition of UCI/LCI

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

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CLASS A FLIGHT MISHAPS

Manned Aircraft Only

	14-Jan-16	14-Jan-15
CLASS A FM/FM RATE FY COMPARISON:	2/3.32	2/3.02
FY15 MISHAPS/MISHAP RATE:	7/2.88	
10-YEAR AVERAGE (FY06-15) MISHAPS/MISHAP RATE:	6.10/2.16	

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.