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**AVIATION MISHAP PREVENTION—
A PROGRESS REPORT**

HEARING

BEFORE THE

SUBCOMMITTEE ON READINESS

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

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AVIATION MISHAP PREVENTION—A PROGRESS REPORT

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON READINESS,
Washington, DC, Thursday, June 21, 2018.

The subcommittee met, pursuant to call, at 4:21 p.m., in room 2118, Rayburn House Office Building, Hon. Joe Wilson (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. JOE WILSON, A REPRESENTATIVE FROM SOUTH CAROLINA, CHAIRMAN, SUBCOMMITTEE ON READINESS

Mr. WILSON. Good afternoon. The Readiness Subcommittee of the House Armed Services Committee will come to order.

I welcome each of you to this hearing of the Readiness Subcommittee on “Aviation Mishap Prevention—a Progress Report.” Today, the subcommittee will hear from each of the services on the efforts of each to reduce the number of aviation mishaps, focusing on any preliminary conclusions on common causal factors to these mishaps and any changes made to improve safety and decrease mishaps.

We owe it our service men and women to eliminate preventable accidents and continue to strive to provide the resources necessary for the most capable and most trained military in the world. Readiness is not just having enough spare parts on the shelves or enough aircraft to fly; readiness is also training service members to be proficient in their jobs.

As witnesses testified last week during the Tactical Air and Land Forces Subcommittee hearing on the Department of Defense aviation mishap review and oversight process, most mishaps are due to human error. Although human error may be a primary causal factor in most aviation accidents, there are ways to reduce human error.

During your testimony, please ensure you highlight how your service is taking actions to reduce human error and prevent today’s accidents while we all work to ensure that service members have the time, tools, and training to be successful and prevent future aviation mishaps.

Before I introduce the witnesses, I turn to the distinguished ranking member of the Readiness Subcommittee, the gentlelady from the territory of Guam, Congresswoman Madeleine Bordallo, for her opening comments.

[The prepared statement of Mr. Wilson can be found in the Appendix on page 25.]

**STATEMENT OF HON. MADELEINE Z. BORDALLO, A DELEGATE
FROM GUAM, RANKING MEMBER, SUBCOMMITTEE ON READ-
INESS**

Ms. BORDALLO. Thank you very much, Mr. Chairman. And I commend you for organizing this hearing on such an important and timely topic. And thank you as well to all of our witnesses this afternoon for being here with the committee.

The military's aviation mishap trends are troubling to me, and I strongly support Ranking Member Adam Smith's proposal for an independent national commission on military aviation safety. The commission would study accident rates, compare them to historic averages, and determine what steps can be taken to improve military aviation safety, an effort I had hoped the Department would lead.

In addition to that effort, I hope that each of you can share with the committee today your plans to improve aviation safety within your services in parallel with our efforts to establish this commission.

Each service has suffered at least one mishap in 2018 resulting in the loss of life. Yet aside from 1-day safety standdowns after a mishap, I have not seen other specific decisive actions taken to address recent mishaps. Moreover, I have doubts about the effectiveness of a 1-day standdown.

Recent mishaps have been attributed to an aging fleet, lack of proper sustainment and maintenance, and in some cases, even an aircrew error. I understand that we cannot discuss the specifics of the recent mishaps until safety investigations are completed. However, I would ask that each of you outline your initial analysis of determining factors for overall trends, as well as your recommended solutions with your service and across the joint force.

Regardless of the reason for these mishaps, the bottom line is that there is no room in our current aviation readiness status to suffer personnel or material losses that should be avoidable. I think it appropriate during our discussion today that all the witnesses and members in the room remember the soldiers, the sailors, the Marines, and the airmen that we have lost in noncombat-related aviation accidents, and remain cognizant of the role that both Congress and DOD [Department of Defense] have played in setting conditions leading up to those accidents.

The military aviators of our Nation are counting on us to get it right and provide them with the tools that they need to successfully and safely employ their aircraft at the highest levels of performance.

And with that, I thank you, Mr. Chairman, and I yield back.

Mr. WILSON. Thank you, Congresswoman Bordallo.

We are pleased to recognize our witnesses today. And I want to thank them for taking the time to be with us. We look forward to your update on how your service is preventing aviation mishaps.

We have with us today Lieutenant General Chris Nowland, the Deputy Chief of Staff of Operations. We have Lieutenant General Steven Rudder, the Marine Corps Deputy Commandant for Aviation; Major General William Gayler, the Commanding General, U.S. Army Aviation Center of Excellence; and Rear Admiral Roy Kelley, Commander, Naval Air Force Atlantic.

And, Lieutenant General Nowland, we begin with you with your opening comments.

**STATEMENT OF LT GEN MARK C. NOWLAND, USAF, DEPUTY
CHIEF OF STAFF FOR OPERATIONS, U.S. AIR FORCE**

General NOWLAND. Chairman Wilson, Ranking Member Bordallo, members of the subcommittee, thank you for the opportunity to speak to you today on this very important topic of aviation mishap prevention.

As you know, safety is and will remain a top priority of our service. We totally agree with you, ma'am. We cannot afford to lose a single airman or weapons capability to a mishap that could have been prevented. We understand that risk is always present in our profession, but our goal is to mitigate risk to the greatest extent possible.

Heartbreakingly, the Air Force has lost 18 airmen in fiscal year 2018. In response to these tragic events, the Chief of Staff of the Air Force, General Goldfein, directed all wing commanders and operational maintenance leaders to conduct a 1-day operational safety review. During this day, commanders' primary focus was to talk to their airmen, assess processes, look for areas of improvement, and to determine how to work together to prevent future mishaps.

Not surprisingly, OPSTEMPO [operations tempo] and time to train was highlighted as an issue. This is in line with what we have found across the Air Force.

Last year, we used feedback to help address safety issues with our remotely piloted aircraft [RPA] career field. Remotely piloted aircraft squadrons execute 24/7/365 combat operations, which makes it difficult to train. This impacted the readiness of our forces.

Based on the feedback from our RPA airmen, we put together a cultural process improvement program to address their concerns. This resulted in higher manning levels, pilots' and maintainers' time to train, increased readiness, and we completed a transition to MQ-9s and a significant decrease in RPA mishaps.

Also, our mobility forces have had recent success. U.S. Transportation Command worked with Air Mobility Command to reduce requirements and to provide an aircraft ceiling for daily operations. This reduction freed up C-17 and C-5 aircraft, allowing time for training. Our pilots and maintainers have gained proficiency, our mission-capable rates increased, and we provided valuable resource to our airmen: time.

Time to train is essential for both safety and readiness. Sometimes you always don't get time, things happen. Two weeks ago, we discovered an issue with the B-1 ejection seats. Our commanders sprang into action, activating the entire Air Force team to protect our aircrew and provide combat capability. The team did hard analysis and engineering to find a solution to the ejection seat issue. I am glad to announce the team's efforts paid off. The B-1 started flying again on Tuesday. This is an example of how the Air Force team responded to an increased readiness and lethality of a very complex fleet: The fleet that is new and old, manned and unmanned.

Another challenge in the category of things don't stay fixed is the T-6. We had flown the T-6 for 2.1 million hours before we had an unexpected increase in unknown physiological events. Once again, the entire Air Force team, along with the Navy and NASA [National Aeronautics and Space Administration], sprang into action to identify ways to mitigate the risk so we could continue to safely fly crucial training sorties while simultaneously continuing to investigate the root cause.

On a personal note, flying aircraft is unforgiving and dangerous. As you know, earlier this year, we lost a Thunderbird pilot, Major Stephen Del Bagno. He graduated from undergraduate pilot training at Vance when I was the wing commander. He was the first Vance undergraduate pilot training pilot to get an F-22. "Cajun," his call sign, was really, really good. Yet on 4 April, flying low to the ground on a practice demonstration as a Thunderbird, the thing he loved to do and wanted to do, he lost his life. We know this impacted his mom, dad, family, squadron mates, and people that knew Cajun. Real people miss him because he was an outstanding leader, wingman, and person.

Aviation is inherently dangerous. The Thunderbirds completed their airshow 40 days later on 19 May. We investigate, we mitigate risk, but we will never quit. But we are committed to doing our best to mitigate the risk to our pilots and our aircrew.

I look forward to your questions.

[The prepared statement of General Nowland can be found in the Appendix on page 26.]

Mr. WILSON. Thank you very much, Lieutenant General Nowland.

We now proceed to Lieutenant General Rudder.

**STATEMENT OF LTGEN STEVEN R. RUDDER, USMC, DEPUTY
COMMANDANT FOR AVIATION, U.S. MARINE CORPS**

General RUDDER. Chairman Wilson, Ranking Member Bordallo, distinguished members of the House Armed Services Subcommittee on Readiness, and other distinguished members, I appreciate the opportunity to testify on the current state of Marine Corps aviation readiness and safety.

As you are aware, the Marine Corps title 10 responsibility is to be the Nation's expeditionary force in readiness. Your Marines continue to train hard for a constant deployment cycle. We hold them to high standards, and we deploy these Marines around the world at a moment's notice. I am proud of these Marines, as I know you are as well.

Fiscal year 2017 was a tough year for Marine aviation in terms of Class A mishaps. In 2017, 20 percent of our mishaps occurred at sea, 40 percent in an expeditionary environment, and 60 percent were deployed. Despite the fact that we are well within our normal rates over 10-year average, 2017 was not good, and it has our full attention.

I am in direct coordination with the gentlemen to my left and right on a regular basis, sharing ideas and trying to capture best practices. The Marine Corps uses operational risk management, a system originally adopted by the Army. We are in the process of transitioning to the Air Force aviation safety awareness program.

The Navy and Marine Corps are also transitioning to a new risk management information system, which replaced the current mishap reporting system, which will allow us to broadly share more information about individual mishaps. We also sit together on a joint services safety council.

Marine aviation is somewhat unique. We have rotary wing, we have tilt rotor, we have TACAIR [tactical air], and we fly transport. Within those communities, we have seen the greatest percentage increase in Class C. And to that, we have seen a lot of towing mishaps, young Marines trying to do the right things, towing very expensive airplanes into things. So we have revamped our whole towing policy. Most of these happened during night crew which, to most, is when most of the work is done for the next day's schedule. And we have increased a level of expertise and NCO [noncommissioned officer] leadership to our night crews.

We had 12 Class A's total last year, 2 of them were ground mishaps. Two Marines were injured and an F-18 damaged when flammable material in a drip pan caught fire. And in a separate unrelated incident, an aircraft maintainer doing maintenance when the lightning alarms went off, the squadron was trying to get everybody off the flight line in a timely manner, he was struck by lightning and killed.

Out of the 10 class A occurred last year across the full spectrum, not all of them resulted in aircrew fatalities, but all had some kind of corrective action. Some of these are still investigation, so the information I could provide is limited. But to give you an idea of some of the corrective actions we took last year: Our KC-130, our C-130 Tango tragic accident last year saw the loss of 15 Marines and a corpsman. We hadn't had a C-130 crash in over a decade. One squadron, only 12 airplanes, we downed—in concert with the Navy, we downed that fleet. We downed that fleet over the abundance of caution, not really knowing what the cause was, but as we do with many of these, we don't know what the cause is. We downed a fleet and we didn't get them flying again until we replaced all the props in all the airplanes.

We also had an MV-22 strike the back of an LPD [amphibious transport dock] off the coast of Australia. Not knowing exactly what the dynamics were with that particular mishap, we went ahead and changed the flight procedures and policies of how we approached the back of a ship. We reduced the maximum allowable weight allowance for an aircraft approaching the back of the ship. We changed and increased the required wind envelope for that aircraft approaching the ship at the weight, giving a greater power margin for all our aviators around the world approaching that ship.

We also had an MV-22 crash in reduced visibility landing environment in an undisclosed location in a CENTCOM [U.S. Central Command] theater. The crew was perfectly legal to fly that mission, as per all our publications. But for that environment, we took the Air Force model of what AFSOC [Air Force Special Operations Command] does and increased the proficiency level on how many reduced visibility landings you are supposed to do into the dirt before you are allowed to do the mission.

Another challenging aspect is you never know the one you prevent. While there is still no direct link between low readiness rates

and causation to Class A mishap rates, we continue to believe a true metric of health in aviation is aircrew flight hours. Well-trained practiced aviators react to malfunctions in difficult circumstances far better and are much less likely to make mistakes, which in turn allow them to react in a fluid situation or unforeseen event.

I will give you an example of some data, and it is from a certain event. Last year, one of our first Class A mishaps was a 53 Echo off the coast of Okinawa. This aircraft in the number two engine area caught fire. The fire began burning at a level which the aircraft became flyable, but in an extremis situation. The pilot, being calm, the crew fighting the fire in the back, that pilot had 30 hours in the past 30 days. She handled that emergency magnificently. She flew, she executed the procedures, she got it on the ground, got the crew out, and saved the crew. Unfortunately, the aircraft burned to the ground because of the fire, but she performed emergency procedures and was calm and cool throughout that. Thirty hours in 30 days, I think there is something to that.

Each of our events are also thoroughly investigated in a learning attempt to prevent future mishaps, through initiatives like the new risk management information system and this aviation safety awareness program. Think of this program like a hotline for safety. So when a pilot comes back, he fills his system out after every flight, and the squadron flight safety officer reviews every flight. It is anonymous. So if he sees something that is unsafe, whether it is with the airfield or the aircraft or the crew, he can report that. We are just starting that now, and we are having success identifying some hazards.

I say this knocking on wood and with somewhat optimism is that this year our readiness is up, our flight hours are up. We averaged 17.2 hours per pilot on an average, which is up from 12 and 13 a few years ago. And as of fiscal year 2018 today, our mishap rate from a 3.99, one of our highest last year, is hovering as we go through at about 1.7 to 1.8. So we have had three Class A in-flight mishaps, two of those certainly we are still investigating.

So I say this, Mr. Chairman, distinguished committee members, we appreciate your continued support. We are hard at work on this to increase our readiness and be ready to fight tonight.

I look forward to your questions.

[The prepared statement of General Rudder can be found in the Appendix on page 37.]

Mr. WILSON. Thank you very much, Lieutenant General Rudder. And we now proceed to Major General Gayler.

STATEMENT OF MG WILLIAM K. GAYLER, USA, COMMANDING GENERAL, U.S. ARMY AVIATION CENTER OF EXCELLENCE, U.S. ARMY

General GAYLER. Chairman Wilson, Ranking Member Bordallo, other distinguished members of the Readiness Subcommittee, thank you for the opportunity to discuss Army aviation readiness and safety. It is a privilege to represent the Army leadership, the soldiers, the civilian professionals, and the men and women of Army aviation who steadfastly serve this Nation every single day.

The first priority of Army aviation remains building and maintaining combat readiness, when successfully realized, enables safe aviation operations. And we define readiness as fully trained and proficient units, capably led, equipped with modern and capable platforms at the correct capacity.

As a result, Army aviation mishap rates have steadily declined over the course of the last 35 years. In fact, mishap rates from fiscal year 2016 to today constitute the lowest 3-year period in the past 35 years. But while our rates tend to trend in the right direction, the Army remains committed to further reduce mishaps.

While aviation operations are inherently dangerous, combat-ready units are better postured to mitigate that risk. However, we continue to balance competing factors that hamper the readiness of our units, meeting today's high demand for aviation, while simultaneously training for a large-scale combat operation, while modernizing our force together.

Manning shortfalls and high OPTEMPO [operation tempo] continue to challenge our unit's ability to train for that large-scale contingency or combat operation, a mission set that has inherently higher risk.

While I sincerely thank Congress for their continued support in the current omnibus and the benefits that it brings to Army aviation, years of fiscal uncertainty have jeopardized certain modernization investments. But regardless, we are continuing to work hard to maintain a competitive advantage over potential adversaries in the future.

Despite these challenges, improvements made by Army aviation and the enterprise in terms of doctrine, leader development, training, and certain material solutions all work to improve readiness today and to better posture that force for tomorrow and any future potential conflict.

Lastly, I can assure you that the United States Army still remains the most modern, well-trained aviation force of its kind in the world. And it provides an unparalleled advantage to our joint force. And our soldiers, our noncommissioned officers, our officers continue to serve with distinction around the globe.

I want to thank each of you for your continued support to the men and women in uniform. And I appreciate the opportunity to testify before you today. And I sincerely look forward to your questions. Thank you.

[The prepared statement of General Gayler can be found in the Appendix on page 44.]

Mr. WILSON. And thank you very much, Major General Gayler. We now proceed to Rear Admiral Kelley.

**STATEMENT OF RADM ROY J. KELLEY, USN, COMMANDER,
NAVAL AIR FORCE ATLANTIC, U.S. NAVY**

Admiral KELLEY. Good afternoon, Chairman Wilson, Ranking Member Bordallo, distinguished members of the subcommittee. I am honored to be here representing SECNAV [Secretary of the Navy] and the Chief of Naval Operations [CNO].

I would like to begin by thanking the subcommittee for authorizing funding that will allow us to improve our readiness. Consis-

tent, predictable funding that we can execute on 1 October is absolutely required for us to be successful in these efforts.

I am happy to report that we are meeting our deployment commitments with properly manned, trained, and equipped forces. I am incredibly proud of the success our aviation units are having in combat. We saw it in Operation Iraqi Freedom, Enduring Freedom, and now in Inherent Resolve.

That being said, we are currently meeting our deployed requirements at the expense of those units that are left at home. As an example, today we have 55 Super Hornets that are non-mission capable due to maintenance, and 118 non-mission capable that are due to supply. Although we are addressing both issues, we are heavily focused on filling holes in existing aircraft and putting stock back on the shelves.

In my meetings with our aircraft maintainers, I hear over and over, Admiral, if you get me the parts, we will provide you more mission-capable aircraft. We are teaming with the Naval Supply Systems Command to prioritize key parts that will get the highest number of aircraft mission capable as soon as possible.

As the CNO recently testified, it took us a decade to get into this readiness decline; it will take us some time to get out. I ask for your patience with our recovery efforts as the process from the appropriation to contracting to delivery of parts is lengthy. On average, the lead time for a new supplier to deliver components to the fleet is ranging from 27 to 39 months.

That being said, we are seeing positive readiness results from our focused efforts on Super Hornets stationed at Naval Air Station Lemoore. Just last week, VFA-122, our fleet replacement squadron that trained Super Hornet pilots, reported 25 mission-capable aircraft on their flight line. This is a very positive indicator, as the squadron was only able to produce six aircraft just 5 months ago.

While a ready fleet is a lethal fleet, it must also be a safe fleet. Our goal is to have zero preventable mishaps. But for those that do occur, we rigorously investigate and disseminate the lessons learned to help prevent the mishap from happening again.

The Navy's Class C mishap rates, those costing the government between \$50 to \$500,000 or nonfatal injuries, have doubled in recent years when compared to 2012. The Class C is the least costly damage to the government property of Class Alpha, Bravo, and Charlies. However, we recognize that any mishap has a negative impact to our readiness and can reverse much of our good efforts.

We have determined from the Naval Safety Center and the Center for Naval Analyses, damage sustained during maintenance is the leading cause of these mishaps, with the analysis pointing to maintainers that are less experienced. The reduced experience is being addressed by doubling the length of orders for shore-based apprentice maintainers from 2 to 4 years, enabling them to gain additional experience and qualifications. Then using the new software program, Aviation Maintenance Experience Management tool, AMEX, we are better able to fully use our sailor skill sets by identifying specific qualifications each sailor has and matching them to the squadrons with the highest need.

The Navy's effort to increase naval aviation readiness while reducing aviation mishaps is an ongoing process. We have to get this

right. Our people are our greatest assets. Keeping them safe and ready to fight is our responsibility. We owe them nothing less.

Thank you for your continued support for our sailors, civilians, and their families. I look forward to your questions.

[The prepared statement of Admiral Kelley can be found in the Appendix on page 53.]

Mr. WILSON. Thank you very much, Admiral Kelley.

And as we begin, I will remind each subcommittee member that we will adhere to the 5-minute rule for questions to our witnesses. Our professional staff Margaret Dean will hold us to the clock, beginning with my questions, beginning with me right now.

And as we begin, I would like to point out that our family especially appreciates your service. I am the son of an aviator, First Lieutenant Hugh Wilson, U.S. Army Air Corps. I am very grateful he served in the 14th Air Force, the Flying Tigers, and served in India and China.

And then your professionalism is recognized. One time, I had the opportunity to visit with President Jiang Zemin at the presidential compound in Beijing. And when I was introduced as a Member of Congress, that was not very impressive. But somebody pointed out that Joe is the son of a Flying Tiger, he stopped the meeting and announced the American military is revered in China. And that is a reflection on your professionalism.

The question for each of you: One factor highlighted in repeated testimony and briefings has been the impact of reduced flying hours, especially in the years following sequestration. How many hours of flight time training should pilots have versus how many hours they are receiving? Beginning with General Nowland.

General NOWLAND. Thank you, sir. Positively, we are moving up on our flying hours. Our pilots right now across the force are averaging 18.66. We have a measurement called the Readiness Aircrew Program, which actually measures the sorties as well as the hours. And our goal is to close that so everyone is not—what is called the Readiness Aircrew Program doesn't become the ceiling, but it becomes the floor. So you will fly above that.

We are not there, but we are heading in that direction, so we are moving in the right direction, sir.

Mr. WILSON. Thank you.

General RUDDER. When we started doing studies on this, really a few years ago, I think we kind of thought that the data was telling us at 15 hours per month puts you in a safety box. For our readiness levels across the Marine Corps, every airframe is a little bit different, but we are counting about 16.9; 16.9 hours gets you to be T2 as we call it, combat-ready for deployment. So we try to attain that before everyone goes out the door. And every unit that goes—deploys overseas is combat-ready to that level.

What we also found is that while we were doing this a few years ago, what we called the ready bench wasn't very ready. Through the readiness efforts, through what this committee and what the Senate and House has done, is we have been able to not only buy new airplanes, but also fix the ones we have.

So I will give you just some examples of where we come on flight hours. And I think you can see this in some of our rates as those flight hours begin to take hold in the end of 2017 and into 2018.

Back in 2016, we were at 13.5 hours per pilot. In 2017, we averaged about 15.4. And today, we are averaging about 17.2, just coming off a couple of 20- and 18-hour months. So that 16.9 hours is being met as a stand stay because of our readiness levels, and I think our pilots are beginning to show experience levels, and certainly our readiness levels are coming up.

Mr. WILSON. Thank you very much.

General GAYLER. Sir, if we look at the Army aviation training strategy of what it requires to have collectively trained proficient units, it requires 14.5 hours per crew, per month. We are currently funded at 10.8 for an Active force and 6.3 and 6.6 for the National Guard and Reserve forces, but that is sufficient for our current level.

Part of readiness and a unit's ability to be ready is a function of several components. One is manning, another is equipping, another is training, but also time. Under the current manning and equipping levels, we are comfortable right now with where we are, but as we continue to train for a larger-scale combat operation, a future fight, not for something we are currently in, we do know that it will take additional flight hours per crew, per month to achieve that level of proficiency. But right now, we are certainly comfortable with our current operations, and there is no direct correlation that we can study and determine between the number of hours specifically and the accident rate, though we do try very hard.

Thank you, sir.

Mr. WILSON. Thank you, General.

Admiral KELLEY. Mr. Chairman, thank you for the question. And naval aviation goes through a training cycle, our Optimized Fleet Response Plan, which starts with building blocks. Basically, our flights would be limited in numbers early on in the training plan, and then on deployment, we would see high numbers.

Our averages throughout naval aviation are 19 for the last 10 years. So 19 hours per month, per pilot for each of the communities. This varies by community and, of course, throughout the workup period it would continue to increase. When we see units that are deployed, those numbers are typically in excess of 30 hours per month and that's because they are doing combat operations.

We have no connection that shows us low flight hours or high flight hours are more impactful to risk. However, the variations between them we do see as high risk. So going from a low OPTEMPO to a high OPTEMPO is a higher risk to mishaps.

Mr. WILSON. And thanks to each of you.

We will proceed to Ranking Member Bordallo. And because of the importance of your testimony, we will also have a second round.

Ms. BORDALLO. Thank you very much, Mr. Chairman, since there is only two of us here.

Gentlemen, my colleagues and I understand that military aviation is inherently dangerous. Your aviators fly faster, they fly lower and closer together than commercial aviation, while they push their aircraft to its limits around the world and in harm's way.

We all understand that it is not possible to eliminate all accidents in your line of work. But I also feel strongly that we owe it

to the aviators and their families to make sure that we are doing everything we can to ensure their safety in the air. Now, to that end, I asked this question in my opening remarks—or I didn't ask the question, but I told you what we had in mind, and it is in the NDAA [National Defense Authorization Act], a sponsored amendment by our ranking member.

Can each of you please take a moment to offer your thoughts on how a national commission on military aviation safety would benefit your service?

General Nowland.

General NOWLAND. Yes, ma'am. Thanks for the question. We would believe that the safety commission could look at overall things. As we have found trends, we find op temper—operational tempo and time are key to both readiness and safety. There, we think that that study would help us highlight that the Air Force is too small for the mission set that we need to do. And I think it would highlight that we need the more manpower and to grow to accomplish a National Defense Strategy, to provide that time to train.

Ms. BORDALLO. Good. General Rudder.

General RUDDER. Yeah, I agree. One of the things that I think that commission would find, I think it would find some efficiencies in pilot production and pilot training. I think it would find some efficiencies in how we maintain aircraft as we begin to compare ourselves to other organizations around the world at how we do maintenance. But I also agree that it would also see OPSTEMPO as a driver.

I would think also it would see maybe as a young force and the turnover that we have within our services that the training to get on step for the next deployment as a driver for some of the mistakes in the maintenance spaces.

Ms. BORDALLO. Thank you.

Major General Gayler.

General GAYLER. Yes, ma'am. Thank you. I think we certainly all agree that any effort to improve the safety and safeguard the treasure of our Nation is certainly worth pursuing. I think it would have—I would recommend it would have to be fairly focused to determine causal factors that affect risk, to include manning, equipping, training. But I think we ought to also capitalize on some of the things we already do with the OSD [Office of the Secretary of Defense] oversight with our joint safety councils that meet and each of our own internal safety center capabilities. But we are certainly encouraged by any opportunity to help better protect our soldiers.

Ms. BORDALLO. Thank you.

And Rear Admiral Kelley.

Admiral KELLEY. Yes, ma'am. Thank you for the question. As we look back at naval aviation history, 50 years, we have had significant changes in our mishap rates and it was because of the advent of NATOPS, Naval Aviation Training Operations Standardization, as well as an angled flight deck. Those were significant impacts to our safety and readiness.

As we look at something new to come on that would help us to be more impactful for the future, I think it needs to be an organiza-

tion that can help us be predictive in the mishaps when they think that they are going to happen, to help us be predictive in that process. Otherwise, I think we are going to have minimal impact in the current safety structures that we have. So if it can be something that helps us in a predictive manner, then I think it would be very helpful.

Ms. BORDALLO. My next question is also for all of you, and I don't think I have the time, but I will continue during second round. I understand that 1-day safety standdowns were ordered after the recent mishaps so that the service could review its safety measures and curb a drastic rise in aviation mishaps. So can you confirm you did conduct a 1-day safety standdown? And can you please share with the committee what benefits your service senior leadership gleaned from the 1-day standdown?

General NOWLAND. Yes, ma'am, we did conduct it. We are in the process with our National Guard units of finishing in it. We—the last one we did was in 2009, General Schwartz ordered one, the entire Air Force. So we agree with you that, you know, we don't do these that often. General Goldfein decided, he had a gut feel, that he wanted to do this.

What we have learned, it goes back—the analysis will be complete, but what we come back to is that operational tempo, the time to train, readiness. And then the other part of this is, from the maintenance side, is predictive analysis on our maintenance. As opposed to just doing maintenance on a time, can we use information technology to develop predictive maintenance, which then gives our maintainers more time to work other issues as to just doing maintenance on a time type of—

Ms. BORDALLO. Mr. Chairman, I would like to hear from the rest, but I will go for the second round.

Mr. WILSON. Well, actually, what we will do, this is such an important issue, and I am so grateful for Ranking Member Bordallo raising this issue, we will proceed. And she actually gets extra time. And indeed, a number of our other colleagues who were here initially, but your opening statements were so thorough that it allowed them to run to another meeting. So thank you very much.

But, of course, Mademoiselle, proceed.

Ms. BORDALLO. Thank you, Mr. Chairman.

So, again, Lieutenant General Rudder, did the value of the 1-day standdown exceed the value of a day of training and, you know, how do you look at it?

General RUDDER. Yes, Congresswoman. We—the Marine Corps, after our second V-22 mishap last fall, we did the same thing, we stood down. And although we do safety standdowns, safety days on a regular basis to align ourselves back to the programmatic side of standardization, safety standardization, we did it just to break the chain.

Aviation sometimes has—when you have a force that is operating hard, running hard, sometimes we call a safety standdown, but sometimes it can be defined as an OPSPAUSE [operations pause], to stop, take a knee, take a deep breath, review all the things that are going around from the other services, from your operational force, and then begin operating again. So we took a day as well.

And—but also, we had an organization that was operating deployed and that organization had two in 1 day, and they shut down for about 2 or 3 days to reassess themselves. Break the chain of events, find out, review how you are doing it, the environment, has something changed, how is everybody doing. Because in deployment, sometimes people get tired and they just need to—they just need to take stock on what is going on and reset.

So these standdowns can have many different effects: to review how to proceed future programs and how to correct yourself, also just to break the chain, assess yourself, look in the mirror, and then step off again.

Ms. BORDALLO. Thank you.

Major General Gayler, on the 1-day standdown.

General GAYLER. Yes, ma'am. Thank you. So most safety stand-downs or a decision to take a tactical pause to assess a very specific component of risk is left to unit-level commanders. We truly believe that safety has to become a culture. You have to kind of inculcate it into everything you do all the time. So we don't not do safety standdowns, but it is left to the judgment of an individual commander based on the operational tempo.

There is usefulness in identifying and isolating events to mitigate risk, but we think it is, you know, very important for us to holistically look at how do you minimize risk, how do you balance tactical risk and accidental risk. And part of that culture is looking at what we train and doctrine. It is looking at how we train in a training environment. It is looking at how we develop our leaders to hone their skills to identify, mitigate, and supervise to reduce risk. But we also have to look at future material solutions, how do you mitigate out risk through technology? So we believe firmly that it is a holistic approach.

Thank you.

Ms. BORDALLO. Rear Admiral Kelley.

Admiral KELLEY. Yes, ma'am. And to answer your question, yes, we did conduct a safety standdown. We typically do safety stand-downs around the holidays, and it is an opportunity to reflect on safety situations. But in this particular case, following the tragic mishap of the F/A-18F in Key West, Florida, and a couple of other Class Charlie mishaps that we had in the month of April, Vice Admiral Miller and I directed that the entire Navy fleet aviation would take a safety standdown.

We put out a P4 message, a "personal for" message to the leadership in each of the squadrons, listing a number of topics that we wanted them to discuss within the command. And I felt it important enough upon myself that I cleared my schedule for the next 2 days after that message went out and had engagements with the commanding officers and their bosses, the wing commanders, and talked to them personally about my expectations for what I thought they should be doing as the commanding officers and understanding the responsibility for them to engage with their people and helping them to direct their people. And specifically in our case, it is maintenance issues that we are focused on.

So I encouraged them to spend time with the maintenance department, spend time with—for example, to take a quality assurance rep, somebody that just recently worked on an airplane, walk

out to that airplane with that quality assurance rep, have that rep show them around that airplane, what they did on that plane, show the interest, and make sure that they understand their value.

Ms. BORDALLO. Thank you very much.

And I yield back, Mr. Chairman.

Mr. WILSON. Thank you very much, Congresswoman Bordallo.

A question for each of you. Will the 2-year bipartisan budget agreement aid you in preventing aviation mishaps? And could you provide some examples of how this agreement provides needed stability? Beginning with General Nowland.

General NOWLAND. Thank you very much. Budget stability is really, really needed. And we appreciate the opportunity and the plus-up of the budget that you have—Congress has provided for us. How it will manifest itself, I think we are putting a large percentage of the plus-up into our weapons system sustainment, which goes into our depots, as well as our flight line maintenance, to build up our spares packages so that our maintainers have the parts, which will thus increase aircraft availability, which will then increase flying hours and ability to train.

So I think it will have an indirect, absolute indirect impact in improving that readiness and that safety, because as we have talked about, we can't find a correlation between flying hours and accidents, but our gut as aviators tells us the more you fly and the more you exercise the jets, good things happen out there. It is that situational awareness.

So we cannot guarantee it, but we are doing everything we can. And we are also following our SECDEF's [Secretary of Defense's] and our Secretary's direction to make sure every dollar we spent is accounted for so we can come back to Congress and tell you where we spent it and how it will improve our readiness and safety factors.

Mr. WILSON. Thank you very much, General.

General Rudder.

General RUDDER. What the past year budget did and certainly the RAA [request for additional appropriations] in 2017, it allowed us to fully fund the readiness accounts. And when I say the readiness accounts, I mean we were able to fully fund our spares and begin recouping some of the degradation in our spares levels that we went into deficits on for the prior years.

We are also able to fund our depot. They were able to hire back a workforce so they could begin getting our aircraft into depot and out of depot in a timely manner. Still work to be done there, but the depots are making a comeback.

Also, engineers. For some of our older aircraft, we have a lot of in-service repairs that we have to do. We have more engineers in our flight line helping the Marines and sailors fix their airplanes. For the maintenance Marines, we were able to put money into what we call the readiness ticker. So if you are a maintenance Marine and you hold a higher level qualification, collateral duty inspector or quality assurance representative, if you reenlist, you get a bonus. Not necessarily reenlist by MOS [military occupational specialty], but reenlist for your qualification. And we are able to keep about 676 talented Marines in the operational force because of this bonus.

Broadly, I think all our colleagues here would attest to more flight hours are better. Things happen in a manner that is more—creates more tactically proficient organizations, more tactically professional pilots that can react to those anomalies that happen on the battlefield or in peacetime every day. So the hours—the money that you gave us went to maintenance and hours, and we are seeing the fruits of that today.

Mr. WILSON. Thank you very much, General.

And General Gayler.

General GAYLER. Yes, sir. So, certainly, the predictable nature of the funding and the sustained funding certainly is very helpful. I mean, I—you know, we look at that readiness capability as being manning, equipping, training, and the time. A great deal of the omnibus and plus-ups have gone to procurement of equipment, which will certainly directly affect our ability to train. The same for aviation survivability equipment, which is a survivability measure, but also a training issue.

So we do know that the best way to ensure combat-ready forces is to provide tough, realistic training at repetitions to standard. And any sustained predictable funding certainly allows us to do that. So thank you.

Mr. WILSON. Thank you very much, General.

We now proceed with Admiral Kelley.

Admiral KELLEY. Thank you, sir. I appreciate the question. As my colleagues have alluded to, it does indeed affect our readiness, and we appreciate the additional funding, the stability that the funding brings for us. And as I described early on, it is impacting our readiness and improving our readiness, as we have seen in the more—with some of the recent numbers for our mission-capable aircraft.

At the same time, I do have some examples that I can allude to with our carriers that—trying to get carriers underway. And a good example would be the CR [continuing resolution] this past December. Had four aircraft carriers I was trying to get underway the week prior to. And understanding that the CR is coming to an end, my concern was, are we going to have a budget afterwards? Is there going to be a government shutdown? And I had to make decisions on what to do with those four aircraft carriers.

A lot of angst, as you might imagine, as we try to make decisions on getting them underway, what is the risk in getting them underway? And as always, there is things that need to be repaired in that process. And so stability will certainly help us and make us much more—much better at our jobs and, I think, able to be more predictable in our readiness levels.

Mr. WILSON. Thank you very much, Admiral Kelley.

We will be concluding with questions by Ranking Member Madeleine Bordallo.

Ms. BORDALLO. Thank you again, Mr. Chairman.

Gentlemen, we often talk about funding flight hours and equipment maintenance when we discuss readiness. However, we have seen that the culture within each service's aviation community is an equally important aspect. So can you just very briefly speak to efforts being made to enhance culture at the unit level that will improve cohesiveness, retention, readiness, and flying safety?

General Nowland.

General NOWLAND. Yes, ma'am. Thank you. Culture, we love culture. Culture is what we have identified in our aircrew crisis task force. It is key towards continued safe readiness, lethal warriors. And it is not a pilot crisis. It is an aircrew crisis, so it is all across all our operations.

We, all the services, use the Army's motto of operational risk management, and we have been using that for years, which has helped us. We are using the Air Force Safety Assessment System, which is bringing forth safety issues so that they can be solved. And then all those little things that we are doing within the aircrew crisis, such as reducing additional duties, providing back—support within the squadron to do some of the scheduling duties and some of those other duties. What we call the quality of life issues with health care and getting people the health care: timeliness, access to care. We have an initiative to bring actual—from what we used in special operators it is called POTFF [Preservation of the Force and Family], Preservation of the Force, where we actually have people to help pilots with their backs and their necks so that we can keep them on the flight line.

So all of that creates a culture of trust. And in the end, when you fly this close to each other, fly this low, salute that crew chief that has given you a high-quality airplane, it comes down to trust, and that is what we are trying to build.

Ms. BORDALLO. General Rudder.

General RUDDER. I think a lot of it that we try to stress more than anything else in the world is leadership. Leadership at all levels, beginning with the commanders. Squadron commanders hold the key to the culture that resonates in that squadron.

So we spend a lot of time in our commanders' course trying to instill how important it is to lead through example, to manage risk as a commander, as well as effectively communicate that to your subordinates. Commanders don't communicate, you start to find you have multiple cultures inside one organization, and that is what we find in failing squadrons. We find multiple people doing their own thing inside one organization. We stress a lot of that and how to manage risk with that, but I think it starts with leadership, it starts with that commanding officer.

Ms. BORDALLO. General Gayler.

General GAYLER. Thank you, ma'am. So when we look at changing culture, you have to look at really everything you do across the force, from doctrine to your organizational design to how you train, leader development, and also material things. I think we are very well focused on that right now. There are a few initiatives that we have underway in every one of those areas, very specifically targeting the culture of balanced risk between tactical risk and accidental risk. One of those is the aviation warfighting initiative where we truly get down to knowing and being expert at critical, technical, and tactical things.

I love the word "trust," because when a soldier gets on the back of a U.S. Army aircraft, they don't know the training you have had. They don't know the experience level you have. They just trust that you are well-trained and very good at mitigating risk. And I think

we are making huge strides in that area and doing a very good job there.

Thank you.

Ms. BORDALLO. Admiral Kelley.

Admiral KELLEY. Yes, ma'am. So naval aviation has three programs that are specifically aimed at culture, and they are tailored under the type commanders: the Aviation Culture Workshop, the Aviation Climate Assessment Survey System Program, and then the Aviation Safety Awareness Program. All are aimed at commanding officers, giving them a level of understanding of their own organizations, and they can be requested that these programs be administered by the safety center to come in. Or in the case of the last one I mentioned there, Aviation Safety Awareness Program, this is an opportunity for aircrew, at the end of their flights, where they can go online and they can advertise information anonymously—I think it was described by General Rudder there—that provides information for near misses. And this is good in allowing us to see what might have happened had somebody not done something. So these programs are aware and they certainly have a positive impact on the culture.

Ms. BORDALLO. Thank you very much.

And my last question, Mr. Chairman, that I have: While stable and predictable funding are specific actions that this committee can help you with, can each of you provide specific actions that you and your services have implemented within the past 6 to 12 months to reduce the number and the rate of aviation mishaps? If you could just—

General NOWLAND. Ma'am, I think what we have talked about many of them are engineering solutions. And sharing information across the T-6 unexplained physiological incidents or episodes is a great example of how we have worked with the Navy and worked with NASA and across materiel commands to work it. We have—working across materiel commands with the Marines on the KC-130s, we share information all the time. And I know we are working as a DOD to try to get common data systems so that we can start to use big data and look at data systems and IT to help us do predictive analysis, not looking in the rearview mirror or seeing where you are now, but predictive analysis of what is going to happen next.

Ms. BORDALLO. Thank you very much, General. I am very impressed with—you have mentioned several of you working together, the various services, and that is impressive.

General Rudder.

General RUDDER. The specific examples of the different airframes. And we have a very unique mission set where we have this tilt rotor, V-22 concept, where we are still trying to manage how we investigate that particular airplane and build in more credible and sustainable maintenance processes so that the readiness levels are up to where it should be. And so the readiness that we are doing as far as the funding you have given us are allowing us to get ahead of our supply challenges with that airplane, which is allowing us to train more.

A lot of our issues that we have have been really built around just sustaining our maintenance cycles so that we can, you know,

get these airplanes so our pilots can get the hours they need. It is not connected to the mishaps, but it is just something when pilots are flying more, it becomes a greater sustainable model for aviation writ large.

Some of those things as far as shipboard operations, we put some of those new policies in place where we are reducing the loads in the airplane, increasing the wind across the deck. We are also, for our deployed model, trying to use the AFSOC model and mandating that you don't go in the combat environment or into a mission unless you have the requisite numbers of reduced visibility landings, you have the requisite hours. And we have increased number of aircraft over there to make sure we are doing that. All of these things come into play to make sure the aircrew gets in the airplane, they are ready to fly the mission mentally as well as with the aircrew and the mission equipment in the airplane.

Ms. BORDALLO. Thank you.

General Gayler.

General GAYLER. Yes, ma'am. If I may, I will give one tactical risk example and one accidental risk example. A tactical risk example is, as we look to any future potential conflict, we have to constantly assess where we need to adjust our training to be best prepared for that. An example, in a highly contested peer-to-peer conflict, we know that we have certain areas that we need to improve training. So we have developed training support packets specifically designed to counter a highly contested environment, to include operations at much, much lower altitudes where your reaction time and the risk goes up significantly, but you have to do that to survive. So we have provided that in the tactical risk.

In the accidental risk area, we do—I am very impressed with our combat readiness center's ability to take a near-miss incident that we specifically train to leaders at every level. We train every colonel, lieutenant colonel, and captain who are going into a command position on what we call the near-miss incidents. We know that the difference between a Class C and a Class A sometimes is seconds and sometimes is inches. And we have got to learn from where we have complacency and where we have vulnerability, and that is a hugely eye-opening endeavor and very well received.

Ms. BORDALLO. Thank you.

Rear Admiral Kelley.

Admiral KELLEY. Yes, ma'am. As I mentioned earlier, our focus area is on our Class Cs and understanding what the problems are there. We team with the Navy Center for Analyses to find out what the cause or what they thought the cause was. And as a result of that, as I mentioned, they determined that it was maintenance related, and we determined it was maintenance training.

I think those types of examples where we can get with organizations that help us to—and they are outside organizations—look inside our organization and give us a better understanding of what they see. This being one example of many.

The other, I think that, in looking for the future, and as I mentioned earlier, I think predictive analysis is something that is important in this business as we try to see how can we start to see where the trends are going and stop them before the mishaps happen. And our Naval Safety Center is moving forward with that as

a result of funding that is available from this organization. We thank you for that.

So as they look at hiring staffs, that is going to allow them to get deep into analytics, better understand those analytics, work with the fleets, work with the other services to come back and better understand where the trends are going and help us to stop those trends before they become mishaps.

Ms. BORDALLO. Thank you very much.

And, Mr. Chairman, I want to say thank you. This has been a very informative hearing.

And we appreciate your time and patience while you waited for the voting to conclude.

And, again, I yield back, Mr. Chairman.

Mr. WILSON. And, Ranking Woman Bordallo, the reason it has been informative is because of your interesting questions, which are very helpful, okay, to promote safety for our military personnel.

As we conclude, I want to thank all the witnesses again for being here today. We appreciate your service to our Nation.

And, General Nowland, congratulations on your upcoming retirement from the Air Force, an amazing 37 years. So we are very grateful for your service for American families. And we wish you the best for a healthy and happy retirement.

We are also grateful for Navy Captain promotable Margaret Dean, for her monitoring the timing today.

This hearing is adjourned.

[Whereupon, at 5:20 p.m., the subcommittee was adjourned.]

A P P E N D I X

JUNE 21, 2018

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

JUNE 21, 2018

Statement of the Honorable Joe Wilson
Chairman, Readiness Subcommittee
“Aviation Mishap Prevention – A Progress Report”
June 21, 2018

Good afternoon. The subcommittee will come to order. I welcome each of you to this hearing of the Readiness Subcommittee on “Aviation Mishap Prevention – A Progress Report.”

Today the subcommittee will hear from each of the services on the efforts of each to reduce the number of aviation mishaps, focusing on any preliminary conclusions on common causal factors to these mishaps, and any changes made to improve safety and decrease mishaps.

We owe it to our service men and women to eliminate preventable accidents and continue to strive to provide the resources necessary for the most capable and most trained military in the world. Readiness is not just having enough spare parts on the shelves or enough aircraft to fly. Readiness is also training service members to be proficient in their jobs.

As witnesses testified last week during the Tactical Air and Land Forces subcommittee hearing on the “Department of Defense Aviation Mishap Review and Oversight Process,” most mishaps are due to human error. Although human error may be the primary causal factor in most aviation incidents, there are ways to reduce human error. During your testimony, please ensure you highlight how your service is taking actions to reduce human error and prevent today’s accidents while we all work to ensure that servicemembers have the time, tools, and training to be successful and prevent future aviation mishaps.

Before I introduce the witnesses, I turn to the distinguished Ranking Member of the Readiness Subcommittee, the gentlelady from the territory of Guam, Congresswoman Madeleine Bordallo, for her opening comments.

DEPARTMENT OF THE AIR FORCE
PRESENTATION TO THE SUBCOMMITTEE ON READINESS
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

SUBJECT: AVIATION MISHAPS AND A CULTURE OF SAFETY

STATEMENT OF: LIEUTENANT GENERAL MARK C. NOWLAND
DEPUTY CHIEF OF STAFF FOR OPERATIONS
HEADQUARTERS, U.S. AIR FORCE

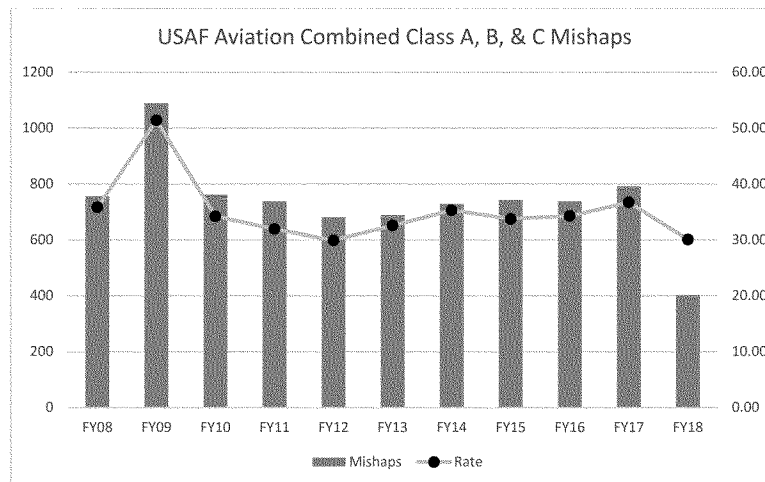
JUNE 21, 2018

NOT FOR PUBLICATION UNTIL RELEASED
BY THE COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

INTRODUCTION

Chairman Wilson, Ranking Member Bordallo and distinguished members of the subcommittee, thank you for the opportunity to appear before you today on this very important topic. Safety remains a top priority for our service to ensure the preservation of all our personnel, equipment and in the end our combat capability and readiness. While risk will always be present in our missions, especially in the aviation domain, our goal is to understand the associated hazards, and to eliminate or mitigate them to the greatest extent possible.

People are the Air Force's most valuable asset and caring for our Airmen is our solemn duty. Every member of the Air Force makes a valuable contribution to the defense of our nation. While the Air Force has continued its 10-year downward trend of Class A and B mishap rates, our manned aviation flight mishap rate has seen an increase since the beginning of the fiscal year. Our aviation mishap rates, calculated by mishaps per 100,000 flying hours, are as follows (as of 23 May 2018):



-- Last decade (since FY2008): the aviation Class A through C rate, including both manned and unmanned aircraft, has decreased by 16%. Specifically, our Class A mishap rate has decreased 35%, the Class B mishap rate has decreased 50%, and the Class C mishap rate has decreased 9%.

-- Last two years (since FY2016) – the Class A mishap rate decreased 12%, the Class B mishap rate increased 5%, and the Class C mishap rate decreased 14%.

-- In FY2018 (as of 23 May 2018), the overall Air Force aviation Class A mishap rate has decreased 5%, the Class B rate increased 38%, and the Class C rate decreased 18% when compared to FY2017. Unmanned aviation Class A mishap rate has decreased 100% compared to FY2017, however manned aviation mishaps rate for the Class A category has increased by 53%. Unfortunately, we have lost 18 Airmen in FY2018.

Because of the increase in manned aviation mishaps in FY2018, the Air Force Chief of Staff, General David Goldfein, directed all wing commanders, and operational and maintenance leaders to conduct a one-day non-flying Operational Safety Review Day. This was completed for all Active Duty Units by May, 2018 and will be completed for all Air Force Reserve and Air National Guard Units by the end of June, 2018. During this safety review day, units reviewed past mishaps, evaluated flight line supervision, assessed planning processes, examined flight line operations to identify gaps or seams and ensured decisions regarding acceptable risks are being made at the appropriate levels. All feedback will be used to inform Air Force-wide safety efforts at all levels and improve our operations.

The Air Force Safety Center has a process in place to investigate safety mishaps and implement resolutions. However, as the Chief Operating Officer for the Air Force, I want to

focus on what we are doing to prevent future mishaps and how we are addressing shortfalls across training, equipment and personnel that impact safety.

RISK MANAGEMENT

We serve in an inherently dangerous business, but we must make sure we have the right risk calculus to protect our most valuable asset, our people. One way we have this is thru the Air Force's Operational Risk Management (ORM) program. This program was implemented in 1996 and by 2002 was institutionalized across all Air Force MAJCOMs. Today, all MAJCOMs implement an ORM program that is tailored to the missions they conduct and completed during flight mission planning. Aircrews cover and discuss all phases of the mission and identify risk. Then they develop a mitigation plan for each risk and which is approved by the appropriate command level prior to the start of the mission. Our Airmen have a culture of constantly reevaluating risk and continuously balancing risk with readiness.

Every unit conducting or supporting flight operations has an aviation safety program. In addition, every flying wing has a Flight Safety Officer who is an experienced rated officer and has completed multiple safety courses. He or she helps develop and review appropriate emergency response plans and coordinates on any additional installation plans involving flight safety or aircraft emergencies. These can range from how to deal with airfield wildlife to airfield operations and collision avoidance.

Successful risk management programs are not just about having a robust process in place. In order for them to be effective, personnel must have the right experience and training that gives them the knowledge needed to effectively identify and mitigate risks.

TRAINING

Training is a critical prerequisite to safety. This requires the Air Force to have the right equipment for training and time to do the training. The operations tempo the Air Force has maintained for the last decade has limited the time personnel have to train and the lack of time has impacted the readiness of our Air Force. To address this, the Air Force is working to reduce deployments and provide personnel more time to train. For example, this summer, U.S. Air Forces Central Command is reducing the number of rated 365-day deployments by 29% and eliminating, converting, or transferring 125 deployed overseas positions. Another example is in our strategic airlift forces. U.S. Transportation Command worked with Air Mobility Command to reduce requirements and create time for units to properly train. This has allowed Airmen to gain proficiency in Chemical, Biological, Radiological and Nuclear (CBRN) training for the first time in their careers.

Another area required for effective training, is possessing the right equipment. We continue to modernize our Operational Training Infrastructure with a blend of live, virtual, and “synthetic” platforms with \$2.8 billion budgeted for FY2019. Synthetic capabilities provide opportunities to test and train against the world’s most advanced threats at a reduced cost and avoid unnecessary wear and tear on advanced platforms. Increased funding for simulators and other training equipment allows for quality training while in a safe environment. This equipment, along with providing time to train, are critical for aircrew to obtain the necessary training to increase their proficiency, experience and systems knowledge.

EXPERIENCE

Additionally, the Air Force faces another challenge of having personnel with the right amount and level of experience. This is not only an issue with aircrews but with our

maintenance crews as well. For FY2018 we are adding 2,300 active duty Airmen and raising Air Force levels to 325,100. Our plan calls for achievable, steady growth in the future.

Increasing manpower is only the first step. The next step is to retain experience and train new critical skills. For instance, the aircraft maintenance career field manning was short 4,000 Airmen at the end of FY2015. Over the last two years, we were able to grow that field to a shortfall of only 400 by the end of FY2017. The challenge for aircraft maintenance manning is shifting; manpower shortages have improved, but low experience levels continue to be an issue. It will take several years to develop these Airmen into seasoned professionals. This is a similar problem we have across other career fields in the Air Force. It is not just about overall manning levels, but ensuring we have the right amount of personnel with the right amount of experience.

The Air Force has successfully put programs in place to address these issues. The Remotely Piloted Aircraft (RPA) career field is a perfect example. All MQ-9 combat squadrons execute 24/7/365 combat operations, which makes it difficult to have sufficient time to train. To address this, the Air Force put together two programs, the Culture and Process Improvement Program and the Get Well Plan. These programs provide methodical steps to posture the MQ-9 force for sustained operations and increased lethality. The Get Well Plan objective was to increase manning in combat and training units, which was completed in FY2017. The Culture and Process Improvement Program established an in-garrison Combat-to-Dwell rotation, which allows MQ-9 squadrons to reconstitute in the same fashion as manned flying squadrons that deploy and return from combat zones to focus on training and readiness. This will increase readiness by increasing the peacetime training opportunities for MQ-9 aircrew.

AGING FLEET

Another challenge is the aging of our aircraft. The overall average age of the Air Force Fleet is 27 years; however, the average age of the B-52 strategic bomber and the KC-135 tanker both exceed 50 years. As aircraft age, they experience various degrees of challenges due to the different environments they operate in and the stress of different missions. We work hard to identify this type of aging in pre-programmed inspections. These inspections allow us dedicated time to remove panels and components to identify corrosion or material deficiencies.

Every aircraft we fly, regardless of its age, meets exacting airworthiness standards. However, the older the aircraft get, the more difficult it becomes to replace or repair components. This is one reason why modernization across the Air Force is a top priority of the Secretary of the Air Force. Today's modernization is tomorrow's readiness. Modernization has been underfunded for over a decade and the Air Force must carefully manage a bow wave of modernization over the next ten years.

On the other end of the spectrum, newer aircraft often cost more when mishaps occur. Therefore, an incident with an older aircraft would have been classified as Class C could be Class B or A for newer aircraft based on dollar amounts. For example, an F-22 Foreign Object Debris propulsion mishap resulted in \$3.6M of damage (Class A mishap) however the same issue on an F-15 only resulted in \$1.2M of damage (Class B mishap).

SUMMARY

Safety has been and remains a top priority in the Air Force. The Air Force has made significant strides in reducing mishaps over recent decades. However, we realize the need to continually adjust and focus efforts on emerging hazards. While risk will be ever-present in aviation, our goal is to ensure we identify all hazards to allow the elimination or mitigation of

risk to the fullest extent possible. Air Force Chief of Staff, General David Goldfein, states “We cannot afford to lose a single Airman or weapons system due to a mishap that could have been prevented.” On behalf of the 670,000 active, guard, reserve, and civilian Airmen and their selfless families, thank you for opportunity to testify before you today. I look forward to your continued leadership and partnership in defense of this great nation.

Lieutenant General Mark C. Nowland

Lt. Gen. Mark C. Nowland is the Deputy Chief of Staff for Operations, Headquarters U.S. Air Force, Washington, D.C. He is responsible to the Secretary of the Air Force and the Chief of Staff for formulating policy supporting air, space, cyber, and irregular warfare, counter proliferation, homeland security and weather operations. As the Air Force operations deputy to the Joint Chief of Staff, the general determines operational requirements, capabilities and training necessary to support national security objectives and military strategy.

General Nowland is a 1985 graduate from the U.S. Air Force Academy. He previously commanded at the squadron, wing, and numbered Air Force levels. He also served on the Joint Staff, US SOUTHCOM and two Air Force major command staffs. The general has flown combat operations in support of operations Southern Watch and Iraqi Freedom. He is also a graduate of the School of Advanced Air and Space Studies and was a National Security Fellow at the Olin Institute at Harvard University. Prior to his current assignment, General Nowland was the Commander, 12th Air Force, Air Combat Command, and Commander, Air Forces Southern, U.S. Southern Command, Davis-Monthan Air Force Base, Arizona.

General Nowland is a command pilot with more than 3,600 flying hours, primarily in the A-10, F-15A/C/D, T-37B, T-38A/C A/T-38B and T-6.

EDUCATION

1985 Bachelor of Science degree in electrical engineering, U.S. Air Force Academy, Colorado Springs, Colo.
 1990 Squadron Officer School, Maxwell AFB, Ala.
 1998 Air Command and Staff College, Maxwell AFB, Ala.
 1999 School of Advanced Air and Space Studies, Maxwell AFB, Ala.
 1999 Master of Aviation Sciences degree, Embry-Riddle Aeronautical University, Daytona Beach, Fla.
 2003 Air War College, by correspondence
 2004 John M. Olin Institute for Strategic Studies, Harvard University, Cambridge, Mass.
 2008 Air Force Enterprise Leadership Seminar, Kenan-Flagler Business School, University of North Carolina, Chapel Hill
 2009 Joint and Combined Warfighting School, Joint Forces Staff College, Norfolk, Va.
 2011 Joint Force Air Component Commander Course, Maxwell AFB, Ala.
 2012 National and International Security Leadership Seminar, Latin America Forces, Washington, D.C.
 2013 Combined Force Maritime Component Commander Course, Miami, Fla.
 2014 Joint Flag Officer Warfighting Course, Maxwell AFB, Ala.
 2015 National Defense University Pinnacle Course, Suffolk, Va.
 2016 Leadership at the Peak, Center for Creative Leadership, Colorado Springs, Colo.

ASSIGNMENTS

1. July 1985 - July 1986, student, undergraduate pilot training, Williams AFB, Ariz.
2. July 1986 - July 1988, T-37B Instructor Pilot, Williams AFB, Ariz.
3. July 1988 - December 1989, T-37 Instructor Pilot, Randolph AFB, Texas
4. December 1989 - August 1990, student, AT-38B lead-in fighter training, 435th Tactical Fighter Training Squadron, Holloman AFB, N.M.
5. August 1990 - May 1991, student, F-15C Replacement Training Unit, 1st Tactical Fighter Training Squadron, Tyndall AFB, Fla.
6. May 1991 - July 1995, F-15 Instructor Pilot, 71st Fighter Squadron, Langley AFB, Va.
7. July 1995 - July 1997, F-15 Fighter Flight Commander, 85th Operations Support Squadron, Naval Air Station Keflavik, Iceland
8. July 1997 - July 1999, student, Air Command and Staff and the School of Advanced Air and Space Studies, Maxwell AFB, Ala.
9. July 1999 - February 2000, Chief, Doctrine Branch, Headquarters U.S. Air Forces in Europe, Ramstein

AB, Germany

10. February 2000 - May 2001, Deputy, Commander's Action Group, Headquarters U.S. Air Forces Europe, Ramstein AB, Germany

11. June 2001 - June 2002, Assistant Operations Officer, 94th Fighter Squadron, Langley AFB, Va.

12. June 2002 - May 2003, Operations Officer, 71st Fighter Squadron, Langley AFB, Va.

13. May 2003 - May 2004, Commander, 1st Operations Support Squadron, Langley AFB, Va.

14. June 2004 - May 2005, Olin Fellow, Institute for Strategic Studies, Harvard University, Cambridge, Mass.

15. June 2005 - May 2006, Chief, Program Support Division (J39), Joint Staff, the Pentagon, Washington, D.C.

16. May 2006 - June 2007, Executive Assistant to the Director of Operations (J3), Joint Staff, the Pentagon, Washington, D.C.

17. June 2007- July 2008, Vice Commander, 48th Fighter Wing, Royal Air Force Lakenheath, England

18. July 2008 - May 2010, Commander, 71st Flying Training Wing, Vance AFB, Okla.

19. May 2010 - June 2012, Director, Plans, Programs, Requirements and Assessments Directorate, Air Education and Training Command, Randolph AFB, Texas

20. July 2012 - June 2013, Director for Strategy, Policy and Plans (J5), Headquarters U.S. Southern Command, Miami, Fla.

21. June 2013 - December 2014, Chief of Staff, Headquarters U.S. Southern Command, Miami, Fla.

22. December 2014 - October 2016, Commander, 12th Air Force, Air Combat Command, and

Commander, Air Forces Southern, U.S. Southern Command, Davis-Monthan AFB, Ariz.

23. October 2016 - present, Deputy Chief of Staff, Operations, Headquarters, U.S. Air Force, Washington, D.C.

SUMMARY OF JOINT ASSIGNMENTS

1. June 2005 - May 2006, Chief, Program Support Division (J39), Joint Staff, the Pentagon, Washington, D.C., as a colonel

2. May 2006 - June 2007, Executive Assistant to the Director of Operations (J3), Joint Staff, the Pentagon, Washington, D.C., as a colonel

3. July 2012 - June 2013, Director for Strategy, Policy and Plans (J5), Headquarters U.S. Southern Command, Miami, Fla., as a brigadier general

4. June 2013 - Dec 2014, Chief of Staff, Headquarters U.S. Southern Command, Miami, Fla., as a brigadier general and major general

FLIGHT INFORMATION

Rating: command pilot

Flight hours: more than 3,600 hours

Aircraft flown: A-10, F-15A/C/D, AT-38B, T-38A/C, T-6 and T-37

MAJOR AWARDS AND DECORATIONS

Defense Superior Service Medal with oak leaf cluster

Legion of Merit with oak leaf cluster

Bronze Star Medal

Meritorious Service Medal with three oak leaf clusters

Air Medal

Aerial Achievement Medal with oak leaf cluster

Air Force Commendation Medal with oak leaf cluster

Air Force Achievement Medal with two oak leaf clusters

OTHER ACHIEVEMENTS

Chilean Cross for Aeronautical Merit

SICOFAA Legion of Merit Medal In Grade of "Great Cross"

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 29, 1985

First Lieutenant May 29, 1987

Captain May 29, 1989
Major May 1, 1996
Lieutenant Colonel May 1, 2000
Colonel July 1, 2005
Brigadier General Aug. 6, 2010
Major General Dec. 31, 2013
Lieutenant General Dec. 19, 2014

(Current as of November 2016)

NOT FOR PUBLICATION UNTIL RELEASED BY THE
HOUSE ARMED SERVICES COMMITTEE
READINESS SUBCOMMITTEE

STATEMENT OF
LIEUTENANT GENERAL STEVEN R. RUDDER
DEPUTY COMMANDANT FOR AVIATION
BEFORE THE
READINESS SUBCOMMITTEE
OF THE
HOUSE ARMED SERVICES COMMITTEE
ON
AVIATION READINESS

June 21, 2018

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
READINESS SUBCOMMITTEE

INTRO

Chairman Wilson, Ranking Member Bordallo, distinguished members of the House Armed Services Subcommittee on Readiness, and other distinguished members: I appreciate the opportunity to testify on the current state of Marine Corps aviation readiness.

As you are all aware, the Marine Corps' Title 10 responsibility is to be the nation's expeditionary force in readiness. We are charged and expected to always be the most ready when the nation is least ready. This responsibility is at the very core of our identity as Marines. Marine aviation readiness has continued improving since last November. In that time Marines executed 126 operations, were part of 86 security cooperation events with partners and allies, and participated in 34 major exercises. Today there are over 35,000 Marines stationed or deployed in 67 countries around the world. 23,000 of these Marines remain stationed or deployed west of the International Date Line to maintain regional stability and deter aggression in the Indo-Pacific region.

MARINE AVIATION READINESS UPDATE

As Deputy Commandant for Aviation, my focus is building readiness for combat. By modernizing the force, supporting Marine aircraft maintainers, and continuing MAGTF integration, we as a team are ensuring Marine Corps aviation is ready to fight tonight. The truest metric of health in aviation is aircrew flight hours, because that number – which is easy to track, and which allows us to compare our combat readiness month over month and year over year - encompasses aircraft readiness, aircrew preparation, and flexible logistics and responsive supply chains.

We have seen significant improvement in aircrew flight hours since I spoke to you in November 2017. This shows our comprehensive recovery strategy is working – we are adding aircraft to the flight line and our aircrew continue building proficiency. In the last twelve months we averaged 17.2 hours per crew per month. In eight of those twelve months, Marine Corps aviation was at our T2.0 goal. Currently, Marine aircrew are flying 20% more flight hours on a year over year basis.

However, we are still challenged with low aircraft readiness rates. This is because, as we fly our pilots more often, we use our aircraft more often. We expect aircraft readiness rates to improve as effects from funding take hold beginning in FY19.

Since last November, though we have increased the number of mission capable aircraft three percent on our flightlines, most of our squadrons still lack what we need to “fight tonight.” Through modernization and readiness recovery we have improved readiness rates in the active component to 61% - a significant number when discussing combat effectiveness. However, it is still short of our goal of 75%, but I am confident that the fleet is healthier today with our ability to conduct maintenance and generate sorties for our pilots.

Our most successful achievement has been realized in the MV-22 Fleet Replacement Squadron where the Marine Corps invested heavily in modernization. Today, this FRS has an 81% mission capable rate and is achieving predictable training goals. We are designed to do a lot with a little, and we are rebuilding our “ready bench.” We will continue adding mission capable aircraft to our flight lines by executing our readiness recovery plan, and by modernizing our fleet. Readiness recovery initiatives like CH-53E “reset” and MV-22 Common Configuration Readiness and Modernization (CCRAM) are positively impacting recovery.

Healthy readiness is also contingent upon having spare parts and trained aviation maintenance Marines to fix our aircraft. We strive to place the right people with the right leadership and skill sets in positions of authority and responsibility. Marine aviation maintainers are a very young force operating on the most technologically advanced aircraft in the world, and we need to retain the best and brightest. Since we offered the aircraft maintainer “kicker,” 676 Marines of the 1251 eligible Marines – about half- accepted that bonus. This equates to ten experienced, qualified and senior maintainers remaining in each squadron, providing maintenance and mentorship to the next generation.

Keeping qualified aircrew remains a strategic focus of Marine Aviation. We have seen an uptick in the amount of pilots leaving the service, and we are well aware that the airlines are ramping up hiring. Thus far, we have not seen an alarming rate of pilot attrition: currently, attrition is at about eleven percent per year, compared with our historical rates of about eight percent. However, that three percent increase means about ten more aviators – total - per aircraft type leaving us each year than we have had before.

This represents a concern that the service is addressing with a multi-prong solution. The service is working to improve the condition of the flight line to ensure our pilots can train. CNATRA is improving the training pipeline to wing new aviators with little to no “dwell” between stages. To follow through, the Marine Corps has heavily invested in the fleet replacement squadrons, to get qualified aircrew where they want to be and are most needed: our operational fleet. . The Marines are focusing resources to improve the time to train, which is improving the pilot inventory, which is likely to decrease attrition rates. Combined with the aviator bonus that we will maximize, the Marine Corps is committed to remain competitive and able to recruit and retain the nation’s finest current and future aviators.

Another critical area to Marine aviation is our readiness accounts, such as spare and repair parts. These accounts were previously underfunded as a tradeoff to procure modern aircraft. Non-mission capable (supply) continues to be the primary degrader of our readiness, and the slow rate at which we are adding mission capable aircraft to our flight lines is a result. However, since FY17, we have funded these accounts to their maximum executable levels and we are seeing an improvement in the number of parts available to sustain our fleet. With continued funding of these accounts we expect to see a corresponding mission capable aircraft recovery in 18-24 months.

AVIATION MISHAPS

The true metric of health in aviation is aircrew flight hours. We have increased our flight hours over the past year and continue to monitor the progress monthly. Chairman Dunford recently commented on the current flight hours our aircrew are getting compared to what they used to fly. He also discussed the different responses a high-hour aviator and a low-hour aviator may have in a given scenario. He concludes that the high-hour aviator is better-armed to make a split-second assessment and respond to an anomalous situation, correctly. General Dunford's assessment is spot-on.

While there is still no direct link between low readiness rates and high Class A mishap rates, there's no question that naval aviation is an inherently demanding discipline, and is unforgiving of any mistakes. Well trained and practiced aviators react to malfunctions and difficult circumstances far better and are much less likely to make mistakes, which in turn increases the chance of preventing these anomalous events from becoming mishaps. We typically think of mishaps in terms of number of mishaps and mishap rate. Given recent tragic events within our community, one could question whether flying more flight hours is the correct

solution. One might draw the conclusion that more flight hours equals more risk. To that end, mishap rates are expressed in terms of percent per 100,000 flight hours.

Historically, our mishap rates have been fairly flat though there has been a recent spike. However, a deeper analysis might be more revealing if we look at the environment in which we are seeing these mishaps (e.g. reduced visibility landings – or brownouts, shipboard landings, low altitude flying, etc.) compared to how often we are training in that environment (i.e. currency and proficiency). Viewed as a bell curve, the model for our aviators would be exposure to operational risk graphed against appropriate training and flight hours.

Conclusion

Marine aviation readiness is steadily improving, but requires stable, predictable and timely funding. Our readiness recovery lies in modernizing our aircraft, fixing the ones we have, and having trained aircrew ready to fly them. Mr. Chairman, distinguished committee members, we in the Marine Corps appreciate your continued support and look forward to answering your questions.

Lieutenant General Steven R. Rudder
Deputy Commandant for Aviation

Lieutenant General Steven R. Rudder assumed his current position as the Deputy Commandant for Aviation, Headquarters Marine Corps in July 2017. LtGen Rudder is a native of Canton, CT, and was commissioned as a Second Lieutenant in June 1984. LtGen Rudder previously served as the Director of Strategic Planning and Policy (J5), U.S. Pacific Command.

LtGen Rudder's previous assignments include: Serving in Co B, 3rd Amphibious Assault Battalion; Student, NAS Pensacola, FL, designated a Naval Aviator; HMT-303, AH-1J helicopter training; HMLA-367, Maintenance Quality Assurance

Officer and Weapons and Tactics Instructor; unit deployments to Futenma, Okinawa, and Operations DESERT SHIELD/STORM; HMM-161 (REIN), Weapons and Tactics Officer deploying with the 11th MEU(SOC) back to North Arabian Gulf; AH-1 Division Head, Marine Aviation Weapons and Tactics Squadron One; Operations Officer, HML/A-167; Future Operations Officer, deploying with the 22nd MEU(SOC) to EUCOM and CENTOCM AOR, HMM-261(REIN); Office of Net Assessment, the Office of the Secretary of Defense serving as Mr. Andrew Marshall's Military Assistant; Squadron Commander, HML/A-167 deploying to EUCOM AOR in support of Dynamic Mix; Senior Watch Officer, OIF, 3rd Marine Air Wing Tactical Command Center; J5 Lead planner for Afghanistan and Pakistan, CENTCOM, Tampa, FL; deployed to Afghanistan, Pakistan and Qatar in support of Operation ENDURING FREEDOM; Commander, Marine Air Group 26, deploying to Al Asad, Iraq, in support of Operation IRAQI FREEDOM 9.1; Branch Head of Aviation Expeditionary Enablers (APX), Headquarters Marine Corps Aviation; Legislative Assistant to the Commandant, Headquarters Marine Corps, Office of Legislative Affairs; Commanding General, 1st Marine Air Wing, Okinawa, Japan; deployed Wing to Thailand and South Korea.

LtGen Rudder holds a Bachelor of Science Degree in Business Administration from Boston University, a Masters of Military Studies Degree from the Marine Corps Command and Staff College, and a Masters of Strategic Studies from the United States Army War College.

Personal decorations include the Defense Superior Service Medal, Legion of Merit with Gold Star, Distinguished Flying Cross with Combat 'V', Defense Meritorious Service Medal with Gold Star, Meritorious Service Medal with Gold Start, Air Medal Strike Flight 4, Navy Commendation Medal with Gold Star and Combat 'V', Joint Achievement Medal and Navy Achievement Medal.

RECORD VERSION

**STATEMENT BY
MAJOR GENERAL WILLIAM K. GAYLER
COMMANDING GENERAL,
U.S. ARMY AVIATION CENTER OF EXCELLENCE**

BEFORE THE

**SUBCOMMITTEE ON READINESS
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES**

SECOND SESSION, 115TH CONGRESS

**ON
AVIATION MISHAP PREVENTION – A PROGRESS REPORT**

JUNE 21, 2018

**NOT FOR PUBLICATION UNTIL RELEASED BY THE
COMMITTEE ON ARMED SERVICES**

**STATEMENT BY
MAJOR GENERAL WILLIAM K. GAYLER
COMMANDING GENERAL,
U.S. ARMY AVIATION CENTER OF EXCELLENCE**

Chairman Wilson, Ranking Member Bordallo and fellow distinguished members of the Subcommittee on Readiness, I thank you for the opportunity to appear before you to discuss the state of Army Aviation readiness and safety trends. I am honored to represent the Army's leadership, and the Soldiers and Civilians of Army Aviation serving around the globe.

The United States Army maintains the world's largest, most modern, and well-trained aviation force of its kind and provides an unparalleled advantage to the Joint Force. The foundation of our advantage has been and always will be our professional, agile, and adaptive leaders and Soldiers. The number one priority of these leaders and Soldiers is maintaining the level of combat readiness which provides commanders and Soldiers on the ground with a distinct advantage as they fulfill the Nation's commitments. At its essence, Army Aviation combat readiness is defined as fully trained and proficient units led by competent leaders, equipped with modern and capable aviation platforms at the appropriate capacity. It is the combination of these factors that when successfully realized, enable safe aviation operations and allow Army Aviation to thrive as an integral member of the Joint Force.

Maintaining Readiness – Critical to Safe Aviation Operations

Consistent with my testimony before this committee last November, building and maintaining readiness remains Army Aviation's number one priority, which we generate by manning, training, and equipping forces and developing leaders to fulfill the requirements of Combatant Commanders. Readiness is paramount to meet today's extremely high demand for Army Aviation, as well as to ensure that the force is prepared to meet emerging threats. However, we are continually challenged with balancing high global demand with a requirement to train for large scale combat

operations and to modernize the aviation force. Providing adequate readiness is also hampered by shortfalls in manning, aviation maintenance concerns, and years of constrained and unpredictable funding.

Manning

We continue to feel the repercussions of previous force structure adjustments and fiscal constraints that forced tough decisions that prioritized short-term readiness over the long-term health of the force. One such decision was to under-access Regular Army Aviation Warrant Officers for several years. The results of that period of under-accession are still being felt today, where manning shortfalls in junior-grade warrant officers and particular aviation specialties add stress to the force, reduce overall experience levels, and degrade our ability to produce readiness. We are mitigating some manning shortfalls by retaining higher numbers of senior aviation warrant officers, however twenty-five percent of that population is retirement eligible. Furthermore, ongoing and largely unprecedented recruitment of Army Aviators by the commercial aviation industry challenges our ability to maintain adequate manning levels.

The Army continues to address manning concerns through three lines of effort: increasing accessions, increasing training throughput, and retention. The Army will increase annual Aviation Warrant Officer accessions by twenty-five percent by FY 19, while also increasing institutional capacity to train new aviators. Additionally, in October 2017, the Army introduced a graduated incentives program to qualified aviators, targeting pilots nearing the end of their initial six year Active Duty Service Obligation, as well as those who are retirement eligible. Since the incentive program's inception, Army Aviation has retained 344 aviators who were eligible to retire or depart the service. While these mitigation measures are having positive effects in reducing aviation warrant officer shortages, a strategic threat to pilot manning persists which will require resources and continued vigilance to maintain a healthy Army Aviation force.

Aviation Maintenance

Army Aviation is inherently dangerous and our modern aircraft and their complex systems require highly skilled maintenance professionals to ensure the airworthiness of our aircraft. Last November, I discussed the detrimental impact that years of relying on contract-provided maintenance has had on the proficiency of our aviation maintainers. In addition to clear concerns regarding safety, reduced maintainer proficiency has also manifested in fewer aircraft available for training, negatively impacting aviation readiness rates. While dependency on contract maintenance has been reduced, increasing the knowledge and skills of our aviation maintainers will take time. Since I last appeared before this committee, the Aviation Enterprise developed a Standardized Aviation Maintenance Training program that will be released shortly to the field. This program significantly increases rigor in aviation maintenance training and standardization, while also introducing required testing and evaluation of aviation maintainers. While it will take time to see the long-term benefits of this program, this effort will enable the force to better develop and assess aviation maintainer proficiency across aviation formations, ultimately resulting in increased operational readiness.

Fiscal uncertainty also presents difficulties to aviation maintenance, impacting overall readiness. Our modernized supply systems are designed to deliver "peacetime" efficiencies at minimal cost. The "just in time" nature of these systems combined with their focus on satisfying a rolling average of past demand makes their effectiveness extremely vulnerable to any increased requirement. Increased operational tempo, deployments, quality problems, and contract delinquencies all result in increased demand for critical aviation parts. Furthermore, long acquisition lead times for complex aviation components hamper our ability to rapidly recover from these events. This situation, one of insufficient aviation parts stockage levels, has become a key impediment to Army Aviation readiness as it detrimentally impacts aircraft available for training and also reduces mission capable rates across the force. While the Aviation Enterprise is working hard to rectify these issues, low stocks of certain critical aircraft parts ultimately place Army Aviation one major reliability event or significant emerging requirement away from substantial aircraft readiness challenges.

Training

Army Aviation faces unique challenges as we re-orient our training focus to Large Scale Combat Operations against a peer or near-peer adversary. While the U.S. military appropriately concentrated on counterinsurgency operations over the past seventeen years, potential adversaries invested in capabilities to target our strengths and exploit our weaknesses. Regaining overmatch will require improved readiness with an emphasis on increasingly agile forces that can fight without assurances of dominance in the air, sea, land, space, and cyberspace domains. Defeating more capable and lethal adversaries demands proficiency levels at company and battalion level, proficiency far greater than the levels Army Aviation maintained during counterinsurgency operations. Furthermore, the required capabilities to fight and win on future battlefields are significantly different than the expertise resident throughout much of Army Aviation today, who have honed their skills in counterinsurgency operations. Potential adversaries possess the ability to deny or contest access with longer range fires, enhanced lethality, and integrated air defenses. As a result, our aircrews must once again become far more adept at operating at terrain flight altitudes and in larger formation sizes to mitigate the risks presented by such adversaries. As stated by the Secretary of the Army and Chief of Staff of the Army in the Army Vision published earlier this month, our training must be tough, realistic, iterative, and dynamic, focused on high-intensity conflict and incorporating battlefield innovation and combined arms maneuver with the Joint Force, allies, and partners.

However, our smaller force continues to be challenged to train to these high standards due to the insatiable demand for Army Aviation. Throughout the remainder of FY 18 and into FY 19, we will commit a large percentage of aviation forces to combat deployments or rotational requirements, homeland support requirements, Combat Training Center training requirements and aircraft modernization efforts. While our incredibly capable leaders and Soldiers are working through these tasks, high

operational tempo will continue to challenge their ability to prepare aviation units for Large Scale Combat Operations.

Aviation Safety

All Army Aviation operations are inherently dangerous. Sufficiently mitigating this risk is a complex and resource-intensive effort that requires careful oversight, management, and engaged leadership at multiple levels. Army Aviation Class A mishap rates have steadily declined over the past four decades, with the exception of increased mishaps experienced during the initial stages of major combat operations (*Class A - permanent disability, loss of life or cost greater than \$2 Million*). FY 17 concluded with a mishap rate of 0.99 incidents per 100,000 flight hours, while the current rate for FY 18 is 0.93. In fact, the mishap rates from FY 16 through today represent the lowest three-year period in the last thirty-five years of Army Aviation. Class B and C mishap rates also remain below ten-year averages (*Class B - cost less than \$2 Million but greater than \$500,000; Class C - cost less than \$500,000 but greater than \$50,000*). Despite decreasing mishap trends, Army Aviation Soldiers and leaders remain absolutely committed to improving our safety record.

Human error remains the primary causal factor for all Army Aviation mishaps. In fact, roughly eighty-percent of all Class A through C mishaps involve human factors as the leading or underlying causal factor contributing to the mishap. Within the human factor category, the leading causes are performance-based and judgement errors; while individual training, experience level, supervision, planning, and crew and team training represent the predominant underlying causal factors. We remain confident that the best method to ensure aviators are optimally prepared to handle the complexities of aviation operations is through sufficient training repetitions. While even perfect practice will never completely eliminate human error, the improved confidence and proficiency that our aviators gain through rigorous, realistic, and iterative training not only enhances mission effectiveness, but also mitigates risk to aviation operations.

The Army Aviation Enterprise continues to work diligently to reduce risk and to prevent future mishaps. Initiatives including the development of low altitude emergency

procedures Training Support Package, adjustments to instructor pilot courses to increase tactical employment focus, and adjustments to Army Aviation Doctrine, which all seek to ensure Army Aviators are better prepared to fight and win in Large Scale Combat Operations. Additionally, the U.S. Army Combat Readiness Center is conducting vignette-based training across Army Aviation, drawing lessons learned from Class C mishaps and other “near miss” incidents, which highlight the leading and underlying human factors that often lead to many of our catastrophic aviation mishaps. Furthermore, the Combat Readiness Center is developing and fielding improved information sharing systems that capture near-miss reporting for more ready access and dissemination to the field.

It is important to note that elevated risk levels accompany Army Aviation's shift to training for Large Scale Combat Operations due to the low altitudes required to defeat radar threats, increased complexities that these missions require, and training conducted at echelons above the team and platoon level. Despite elevated risk levels, we cannot afford to be risk averse. We must train to high standards in demanding conditions in order to remain prepared to meet future threats. The alternative is deferring the cost to the next conflict – a price that may be unaffordable.

Modernization

Modernizing Army Aviation to maintain or regain overmatch with potential adversaries requires timely, predictable, adequate, and sustained funding. Prior fiscal constraints have delayed modernization efforts and have largely eliminated strategic depth in the force, resulting in reduced capacity to meet emerging requirements. To win decisively on future battlefields, Army Aviation requires modernized equipment and trained personnel to ensure the force is not outmanned, outgunned, or outdated. The Army Futures Command, once operational, will specifically address these issues with the continued support of the Future Vertical Lift Cross Functional Team.

The current and highly capable aviation fleet will continue to serve us well for future decades. However, Army Aviation requires modernized equipment and capabilities optimized for Large Scale Combat Operations to compete with advancing

military competitors. In the near term, we will make tough choices on how to invest competing dollars in pursuing improvements in reach, protection, and lethality to ensure that our current fleets maintain competitive overmatch. In the mid-term, we continue to pursue Advanced Unmanned Aircraft Systems and Future Vertical Lift solutions to ensure that Army Aviation continues to provide the critical capabilities that ground commanders and the entire Joint Force require to dominate on future battlefields.

Conclusion

Army Aviation is and will remain an essential member of the Joint Force, providing unparalleled capability to Combatant Commanders across the full range of military operations. Despite the unpredictable and uncertain fiscal environment and insatiable demand for aviation forces, our Soldiers, leaders, and civilians remain committed to building and maintaining readiness for the future. Concerns persist, however, that weighting today's efforts to provide readiness comes at significant cost to our level of preparation to meet emergent requirements, as well as to investing in the modernization of the future aviation force. While the Army's senior leaders continue to address these concerns, we ask for your continued assistance in providing predictable and sustained funding to enable readiness and modernization investment to posture Army Aviation for an increasingly complex future. Your continued oversight and support is greatly appreciated.

Mr. Chairman and distinguished Members of this Subcommittee, thank you for your strong and enduring support of the outstanding men and women in uniform, to our Army Civilians, and to their families.

Major General William K. Gayler
Commanding General, United States Army Aviation Center of Excellence

Major General (MG) William K. Gayler assumed duties as the Commanding General, United States Army Aviation Center of Excellence on April 6, 2016.

MG Gayler is a Distinguished Military Graduate of North Georgia College in Dahlonega, Georgia, where he was commissioned as an Aviation Officer in 1988. He holds two master's degrees, one in Military Arts and Sciences and one in National Security Strategy. Maj. Gen. Gayler is a graduate of the Command and General Staff College and the National War College.

MG Gayler's key command assignments include C/2-227th Aviation Regiment in Hanau, Germany; D/2-227th Aviation Regiment in Germany and Bosnia-Herzegovina; A/1-14th Aviation Regiment in Mesa, Arizona; 3-101st (EAGLE ATTACK) Aviation Regiment in Fort Campbell, Kentucky, and Iraq; 101st Combat Aviation Regiment (DESTINY) in Fort Campbell, Kentucky, and Afghanistan; Deputy Commanding General (Support), 7th Infantry Division, Joint Base Lewis-McChord, Washington; Director, Officer Personnel Management Directorate, Human Resources Command, Fort Knox, Kentucky; and Deputy Commanding General, U.S. Army Europe, and Commander, U.S. Army NATO.

MG Gayler's key staff assignments include Aide-de-Camp to the Commanding General of the U.S. Army Aviation Center at Fort Rucker, Alabama; Battalion S3 and Executive Officer with 2-101st Aviation Regiment at Fort Campbell, Kentucky; Brigade S3 and Executive Officer with 101st Aviation Brigade at Fort Campbell, Kentucky; Deputy Director of the Directorate of Evaluations and Standardization at Fort Rucker, Alabama; Deputy G3 RESET Chief of the 101st Airborne Division (AASLT); and Chief of Staff, 101st Airborne Division (AASLT) at Fort Campbell, Kentucky.

Major deployment history includes Operation Desert Shield/Desert Storm, 1990-1991; Former Yugoslavia/Bosnia-Herzegovina, 1995-1996; Operation Iraqi Freedom I, 2003; Operation Iraqi Freedom V-VII, 2005-2006; and Operation Enduring Freedom X, 2010-2011.

MG Gayler is a Master Army Aviator and Standardization Instructor Pilot in the AH-64D Longbow Apache and also rated in the OH-58 Kiowa. His awards and decorations include the Distinguished Service Medal, Legion of Merit (3 Oak Leaf Clusters), the Bronze Star Medal (2 Oak Leaf Clusters), the Meritorious Service Medal (5 Oak Leaf Clusters), the Air Medal (Numeral 6), the Army Commendation Medal (2 Oak Leaf Clusters), the Army Achievement Medal (Oak Leaf Cluster), the Air Assault Badge, the Combat Action Badge, and the Honorable Order of Saint Michael (Bronze and Silver award).

MG Gayler is married to the former Michele Nash of Stone Mountain, Georgia, and they have three daughters - Katie, 26; Margaret, 23; and Samantha, 17.

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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON READINESS

STATEMENT OF

REAR ADMIRAL ROY J. KELLEY

COMMANDER, NAVAL AIR FORCES ATLANTIC
ON

AVIATION READINESS AND SAFETY

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

SUBCOMMITTEE ON READINESS

21 JUNE 2018

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SUBCOMMITTEE ON READINESS

Intro

Chairman Wilson, Ranking Member Bordallo, and distinguished members of the House Armed Services Subcommittee on Readiness, I would like to express my appreciation for the opportunity to share the current state of Naval Aviation, Safety, and the challenges ahead in restoring higher levels of manpower, training, and equipment readiness. On behalf of all the Sailors in Naval Aviation, I would like to thank the members of this subcommittee for their bipartisan cooperation, and for the hard work of all involved in authorizing the funding that will allow us to improve the readiness posture required to continuously protect our national interests.

Our Naval Forces continue to provide lethal capabilities and project power world-wide, fully prepared for conflict in the full range of military operations. The publication of the 2018 National Defense Strategy, alongside the enactment of the 2018 Omnibus Appropriations Bill, will allow Naval Aviation to continue to correct many of the readiness and sustainment shortfalls that have increased under Budget Control Act funding limitations. Our efforts are strongly aligned with the National Defense Strategy, which highlights a return to Great Power Competition and directs increased naval power and response. Naval Aviation will benefit directly and substantively from the recent investments into aviation readiness accounts. Your authorization will allow us the funds necessary to field and deploy our next aircraft carrier, create modest gains in end strength to address critical manpower shortages, and to purchase the spares and material needed to increase the number of fully mission capable airframes.

As we reflect on the lessons we have learned from the impacts of the Budget Control Act funding limitations, we realize that there is much work to be done, and it is important to maintain realistic expectations about the speed with which readiness will be restored. As the Chief of Naval Operations, ADM John Richardson, recently testified, it took us a decade to get into this readiness decline, it will take us some time to get out. It is my expectation that we will begin to see marked improvements in readiness 18-24 months from now, as the effects of proper funding need time to be correctly allocated and spent on our people, our training institutions, and our parts supply system.

Readiness and Safety

Naval Aviation's number one priority is rebuilding and maintaining readiness. All of our units are departing on deployment fully certified and combat ready, but the margins of their readiness are not at the same standards experienced in the past. We are forced to make sacrifices in readiness generation at home to ensure those forward have the training and resources necessary to be successful. In order to

do this, Naval Aviation utilizes a “tiered readiness” construct to ensure our resources are focused on deployed and soon to deploy squadrons. When a squadron returns from deployment, we reassign many of their aircraft, parts, and people to give to the squadrons preparing for work-ups and deployment. We’ve been forced to assume risk in maintenance and production and, as a result, our ability to fix and produce flyable aircraft, and therefore train aircrew, has suffered. There is a critical need for aircrew to fly and acquire qualifications, and there is a need for well-staffed maintenance departments to fix, groom, and support modification upgrades to aircraft throughout the entire Optimized Fleet Response Plan (OFRP). Ideally, 50% of all aircrew qualifications should occur during the Basic and Maintenance phases of the OFRP cycle, the two phases where we consistently “rob” squadrons of their needed planes, parts, and people.

As of April 2018 our Super Hornet community had 270 aircraft mission capable (MC), only half of our total inventory of 545. Of those “up” aircraft, only 174 had all their mission systems fully functional, or were fully mission capable (FMC), possessing the full suite of Strike-Fighter capability. The last time the Super Hornet community hit the CNO’s goal of 75% MC and 58% FMC rates was 2007. A similar story can be told in other communities. Recent funding initiatives are beginning to move us in the right direction and with continued, sustained funding Naval Aviation will transform from where we are today into a more lethal, ready force able to meet the mission goals and challenges of Great Power Competition.

With our focus on Super Hornets at Naval Air Station (NAS) Lemoore, CA, we have begun to see positive gains from our recovery efforts. VADM Chip Miller, who took over the Air Boss position at Naval Air Force Pacific in January 2018, implemented changes to include standing up a Naval Aviation Maintenance Center of Excellence (NAMCE). This unit, comprised of both military and civilian contract personnel, is focused solely on bringing long term down aircraft back to a mission capable status. To date, our efforts at NAS Lemoore have recovered 51 total aircraft to an MC status, 29 of which were long term down. Material availability continues as the pacing item for meeting mission capable readiness, especially within the F/A-18E/F/G communities. We apply each lesson from the Super Hornet community today to enhance our ability to repair aircraft, predict future challenges across the aviation force, and support the warfighter in each of our aviation communities.

Naval Aviation is not narrowly focused on the Super Hornet community readiness challenges. Our ability to win the high end fight will depend on every platform and each of these communities must

bring to bear the people, planes, and parts that are properly trained and resourced. We have our eye on the ball and are actively working to achieve and sustain readiness across the force.

We are making great progress in transitioning out of legacy platforms such as F/A-18C to F/A-18E/F and P-3C to P-8A. VFA-34 and VFA-37 are the final two F/A-18C squadrons the Navy has remaining as active duty squadrons and will complete their transitions to Super Hornets in 2019. We have just recently completed the ninth P-3 to P-8 squadron transition and in March of this year we began the first fleet squadron transition of F/A-18 to F-35C, with that squadron, VFA-147, becoming safe for flight by October 2018.

While a ready Fleet is a lethal Fleet, capable of winning when called upon, it must also be a safety-conscious Fleet. It is our mission to maintain the readiness of our Navy in order to prevent it from degrading to the point where the very safety and well-being of our Sailors is in question. Some say Naval Aviation operations are inherently dangerous, whether conducted in peacetime or during combat operations. While I do not disagree, I prefer to think of Naval Aviation as terribly unforgiving. It is an environment where the margins are measured in inches and seconds. Aviation training operations are a complex and resource-intensive effort which requires careful oversight, management, and leadership to sufficiently mitigate risk to an acceptable level. There is no question that well trained and practiced aviators react to malfunctions and difficult circumstances far better and are much less likely to make mistakes, which in turn decreases the likelihood of these aircrews experiencing a mishap.

Over the past five decades, the Navy dramatically reduced major aviation accident rates, though there has been a recent spike. In particular, Class C mishap rates (\$50,000 to \$500,000 or nonfatal injuries or illnesses) in 2017, and thus far in 2018, are approximately double the rate that Naval Aviation experienced in 2012. A majority of these mishaps occur during routine maintenance evolutions. Research done by the Center for Naval Analysis established that there is a strong correlation between the number of these type of mishaps, and the (lower) experience and longevity (years in service) of mid-grade and senior-grade enlisted maintainers on the flight line. We also recognize that with reduced flight hours, Sailors are receiving fewer opportunities to perform routine maintenance and are missing out on the opportunity to practice their skills.

Naval Aviation Leadership has implemented several initiatives to increase aircraft maintenance personnel manning and experience levels, including doubling the initial Apprentice (E-1 to E-3) tour length at shore maintenance facilities from two to four years. This initiative will improve productivity at

intermediate level shore maintenance activities and Fleet Replacement Squadrons (FRS), eventually providing the Fleet with more experienced aircraft maintenance personnel.

Additionally, the increased use of Aviation Maintenance Experience (AMEX) and AMEX Version 2.0 as a management tool will increase visibility on the existing experience levels and actions needed to increase experience levels of maintenance personnel assigned to squadrons in all Type/Model/Series (T/M/S). AMEX 2.0 establishes a "Maintenance Readiness Floor" developed by wing maintenance officers and their subject matter experts for fleet squadrons. The program is designed to ensure enough maintenance personnel are available to perform two-shift maintenance and to improve alignment of personnel qualifications. The enhancements provided by this tool are already in use by the Navy's detailing community, allowing for better resourcing of commands and ensuring that proper platform knowledge and experience levels are maintained throughout the detailing cycles.

The Naval Aviation Enterprise is also mitigating the risks and addressing current mishap rates with increased leader involvement, policy additions, and by improving communication Fleet-wide to better understand the lessons learned from prior mishaps and near misses. The Air Boss has published several Force-wide messages directly addressing safety and mishap concerns affecting Naval Aviation. Additionally, as part of the Comprehensive Review, we conducted a thorough analysis of two topics: 1) crew endurance policies and their application to non-aircrew members of our Force where fatigue can be a factor that can lead to an increase in mishaps; and 2) increased command focus on meaningful Hazard Report (HAZREP) reporting to include recording "near miss" events. We are also supporting the Naval Safety Center as it transforms to create a new, robust analytical cell, with the goal of providing improved predictive analysis for mishap prevention.

As you are well aware, Naval Aviation's number one safety concern and priority is reducing the risks and effects of Physiological Episodes (PEs) for our aircrew, a concern I know this committee shares. We have implemented numerous technical and operational measures to mitigate the risk to our aircrew and I am cautiously optimistic as we move forward. In April 2017, the Chief of Naval Operations established the Physiological Episode Action Team (PEAT). Led by an aviation admiral, the PEAT is a unified, single-source entity which directs Department of the Navy efforts to combat PEs and synchronizes these efforts with the Department of Defense, non-DoD entities and our foreign partners. The PEAT follows three lines of effort, warn the aircrew, fix the machine, protect and prevent. 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, including 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 and T-6s, our training platforms. 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 and this will remain our top safety priority until we fully understand, and have mitigated, all possible PE causal factors. Fleet awareness is high, confidence in their platforms and our processes are improving, protocols are in place and we will continue to apply every resource to solve this challenging problem.

Conclusion

Naval Aviation continues to operate forward – fully prepared for conflict across 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. In recognizing the importance of predictable and sustained funding, fully funding our readiness accounts across multiple Fiscal Year Development Plans (FYDPs) is the foundation of operational readiness that we require to build and sustain a lethal, resilient force through balanced investments across readiness, capability and capacity. Your continued oversight and support are greatly appreciated.

Mr. Chairman and distinguished Members of this Subcommittee, thank you for your steadfast and strong support of the outstanding men and women in uniform, our Navy Civilians, and their Families.

Rear Admiral Roy J. Kelley
Commander, Naval Air Force Atlantic

Rear Adm. Roy Kelley is a native of Newark, Ohio. He is a 1984 graduate of Southeastern Oklahoma State University in Durant, Oklahoma, where he received a Bachelor of Science in Business. He holds a Master of Arts in National Security and Strategic Studies from the Naval War College in Newport, Rhode Island.

Kelley was designated a naval aviator at Naval Air Station (NAS) Kingsville in August 1986. His early flying assignments in the F-14 community included Fighter Squadron (VF) 102 aboard USS America (CV-66), VF-101 instructor/demonstration pilot, VF-143 aboard USS George Washington (CVN 73) training and quality assurance officer, and VF-32 aboard USS Theodore Roosevelt (CVN 71) maintenance officer.

Kelley's shore tours included F-14 placement officer at the Bureau of Naval Personnel, Joint Staff J-3 Joint Operations Division Central Command planning and briefing deployment orders to the secretary of defense and chairman of the Joint Chief of Staff, Navy Staff Air Warfare Division (N-88) as a F/A-18 requirements officer and the chief of staff for Commander, Naval Air Forces Pacific (CNAF).

Kelley's first command tour was Strike Fighter Squadron (VFA) 102 Diamondbacks aboard USS Theodore Roosevelt (CVN 71) in 2001, a record-setting deployment in support of Operation Enduring Freedom. The Diamondbacks were awarded the Battle Efficiency award, Rear Adm. Clarence Wade McClusky award, Golden Wrench award and Navy Unit Commendation under his leadership. Kelley's second command tour was Carrier Air Wing (CVW) 7 in 2009 where he made two deployments aboard USS Dwight D. Eisenhower (CVN 69) in support of Operation Enduring Freedom. CVW-7 and Eisenhower won the Ramage Award for the best CVW/CVN team in 2009 and 2010.

As a flag officer, Kelley served as the chief of Naval Air Training in 2013, deployed around the world as commander of Carrier Strike Group 12 aboard USS Theodore Roosevelt (CVN 71) in 2015, served as the director of Joint Strike Fighter (JSF) Fleet Integration Office from September 2016 to September 2017, and is currently serving as commander, Naval Air Force Atlantic.

His awards include the Legion of Merit (six awards), Bronze Star (two awards), Joint Meritorious Service Medal, Meritorious Service Medal, Air Medal (seven Strike Flight Awards, Combat V), Navy and Marine Corps Commendation Medal (five Awards, Combat V), Joint Service Achievement Medal, Navy and Marine Corps Achievement Medal, and various campaign, unit and service awards. He has accumulated over 4,000 flight hours and over 940 carrier arrested landings.

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