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ON

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2016

AND

OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS

BEFORE THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES HEARING

ON

COMBAT AVIATION MODERNIZATION PROGRAMS AND THE FISCAL YEAR 2016 BUDGET REQUEST

HEARING HELD
MARCH 26, 2015



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COMBAT AVIATION MODERNIZATION PROGRAMS AND THE FISCAL YEAR 2016 BUDGET REQUEST

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Thursday, March 26, 2015.

The subcommittee met, pursuant to call, at 9:02 a.m., in room 2118, Rayburn House Office Building, Hon. Paul Cook (vice chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. PAUL COOK, A REPRESENTATIVE FROM CALIFORNIA, VICE CHAIRMAN, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. COOK. The hearing will come to order. The subcommittee today meets to receive testimony on the Navy, Marine Corps, and Air Force budget requests for combat aircraft programs for fiscal year 2016.

I would like to welcome our distinguished panel of witnesses today, Vice Admiral Paul Grosklags, Principal Military Deputy to the Assistant Secretary of the Navy, Research Development and Acquisition. And we just had a hearing once again. So we are wearing you out, Admiral. Lieutenant General Jon M. Davis, Deputy Commandant of the Marine Corps for Aviation; Rear Admiral Michael C. Manazir, Director of Air Warfare Division for the U.S. Navy; Major General Timothy M. Ray, Director, Global Power Programs; and Lieutenant General Mike Holmes, Air Force Deputy Chief of Staff for Plans and Requirements.

First of all, I thank you for all your service and look forward to the testimony today.

As we review the fiscal year budget request for combat aviation forces, it is clear the Budget Control Act [BCA] of 2011 continues to force the military to make short-time decisions that have long-term consequences on our national security.

It is clear that the combat aviation programs of the Navy, Marine Corps, and Air Force are confronted by tradeoffs in capability, capacity, and readiness. Capabilities are those modernization programs that provide the systems necessary to defeat current and future threats. Capacity is the ability to retain sufficient force structure to meet current and future requirements. And readiness is the training in these systems.

The Navy and Marine Corps are facing shortfalls in fighter aircraft for fiscal year 2016. The Navy deferred 16 F–35s in the future defense program, trading capability for today's readiness. The Navy has truncated its procurement of F/A–18E/F aircraft, also trading capacity for readiness.

Now the Navy will be 134 aircraft below its requirements of fighter aircraft in the 2020 timeframe, with an average of about 100 aircraft short between now and 2020. If we assume that a shortfall of 65 aircraft will be manageable for the Navy, this leaves the Navy short about 35 aircraft, or 3 squadrons of strike fighters.

Last year, the Air Force canceled the F–16's combat avionics program extension, or CAPES. CAPES would have equipped the block 40, 42, 50, and 52 fleets with new radars and defense systems that increase survivability against emerging threats. This trade was made to meet today's readiness requirements. This year, as it did last year, the Air Force is proposing to retire over half of its A–10 fleet, reducing fighter capacity below the Air Force's 2,000-aircraft requirement.

Increasing the OCO [overseas contingency operations] funding request to offset the solution is something that you have seen in the papers, on the news. There was a critical vote taken last night. I am proud to say I think it went the right way. We didn't get the complete fix that many people, such as myself, wanted. But this is a beginning. And, of course, the ideal solution from my standpoint is to repeal the sequester.

But this is not going to happen with the deal. But as I said, we did get part of the pie. And we've got to continue this. And much of your testimony, many of you have been here before. And it is not just this committee that has to hear this, it is the rest of Congress. I am concerned that this budget request will reduce both capacity and, in our strike fighter forces, affect readiness and result in a higher risk in achieving military objectives in the future.

I look forward to our service witness testimony today, which I hope will expand on the risks associated with the capacity and capability reductions in our combat aviation forces.

I was going to turn to Ms. Sanchez. I think she is running a little late. But when she is—when she gets here, I will ask her to make an opening statement as the ranking member.

And without objection, all witnesses' prepared statements will be included in the hearing record.

Admiral Grosklags, will you please proceed with your opening statement, followed by the rest of the panel as we go down. Thank you.

STATEMENT OF VADM PAUL A. GROSKLAGS, USN, PRINCIPAL MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE NAVY (RESEARCH, DEVELOPMENT, AND ACQUISITION), U.S. NAVY; LTGEN JON M. DAVIS, USMC, DEPUTY COMMANDANT FOR AVIATION, U.S. MARINE CORPS; AND RADM MICHAEL C. MANAZIR, USN, DIRECTOR, AIR WARFARE (OPNAV N98), U.S. NAVY

STATEMENT OF VADM PAUL A. GROSKLAGS

Admiral GROSKLAGS. Thank you, Mr. Chairman, distinguished members of the subcommittee. We appreciate the opportunity to appear before you today to address our Navy and Marine Corps aviation programs.

As you well know, the United States is a maritime nation. We have global interests and global responsibilities. Our Navy and Ma-

rine Corps provide the continuously forward-deployed persistent presence which ensures our Nation's global reach, global access, and ability to project power, regardless of changing alliances, permissions, or circumstances on the ground.

We move at will across the world's oceans, the seas, and the littorals, providing our Nation's leaders with offshore options where it matters and when it matters. The aviation component of our Navy and Marine Corps team enables our sea-based and expeditionary naval forces to bring simultaneous influence over vast stretches of maritime environment, across the shoreline, and deep inland.

As such, it is critical that our aviation forces remain always ready and poised to engage in a moment's notice, with the required capacity and capability to influence events and, if necessary, to fight and to win.

Last year, we saw significant advancements in many of our aviation programs: the first P–8 deployment to the Western Pacific; the standup of a second Special Purpose MAGTF [Marine Air-Ground Task Force] formed around the capabilities of the V–22 and the KC–130J; initial qualification of the Joint Strike Fighter onboard an aircraft carrier.

This year, we look forward to a number of additional milestones, to include the initial operational capability [IOC] of the F–35B with the Marine Corps; initiation of sensor testing on our MQ–4C Triton ISR [intelligence, surveillance, and reconnaissance] platform; the first flight of the Marine Corps CH53K by the end of this year; our first deployment of the the E–2D Hawkeye started this month on the *Theodore Roosevelt.* Along with the Air Force, we have declared initial operational capability for the AIM–120D and will IOC the AIM–9X Block II this month.

For 2016, our naval aviation budget request is based on a number of central themes: fifth generation fighter and attack capability; netted persistent multi-role intelligence, surveillance, and reconnaissance; critical supporting capabilities in electronic attack, maritime patrol, and vertical lift; advanced strike weapons programs; readiness recovery; and targeted modernization of the force to ensure continued relevance and sustainability.

As this subcommittee is well aware, while our security interests face an increasing array of threats and demands, our budget position grows ever more challenging. We will continue to prioritize the readiness of the forces currently forward deployed over all other investments. However, we must also recognize that those Navy and Marine Corps forces this Nation deploys to meet the future threat will be dependent upon the modernization and the readiness efforts provided by the programs of today.

Across the Department, our strategies for the development, procurement, and sustainment of both current and future weapon systems are critically dependent upon stable and—excuse me—predictable funding at a level commensurate with our President's Budget 2016 [PB16] budget request.

The alternative has been made clear by our secretaries and our service chiefs. A smaller force, a force less forward deployed, a force slower to respond in a crisis, and a force which, when it does respond, will be less capable and more vulnerable.

Mr. Chairman, we request your leadership and the support of this subcommittee to provide the resources that enable your Navy and Marine Corps to be our Nation's first responders. We again thank you for the opportunity and look forward to your questions.

[The joint prepared statement of Admiral Grosklags, Admiral Manazir, and General Davis can be found in the Appendix on page 25.]

Mr. COOK. Thank you, Admiral.

General Davis.

General DAVIS. Admiral Grosklags spoke for the Department, sir.

Admiral GROSKLAGS. One statement for the Department, sir.

Mr. COOK. Thank you.

Admiral.

Admiral MANAZIR. Yes, sir. Same thing. One statement for us.

Mr. COOK. Okay. General.

STATEMENT OF LT GEN JAMES M. "MIKE" HOLMES, USAF, DEPUTY CHIEF OF STAFF, STRATEGIC PLANS AND REQUIREMENTS, HEADQUARTERS, U.S. AIR FORCE

General HOLMES. Thank you, Chairman Cook, ladies and gentlemen of the committee. Thank you for your continued support to your United States Air Force, our airmen, and their families. I greatly appreciate the opportunity to address the subcommittee today. And I would like to start with a few opening remarks, and then we will ask that our full written testimony be placed in the record. And thank you for agreeing to that.

Our Air Force remains the most globally engaged Air Force on the planet. And we continue to do our best every day to deliver global vigilance, global reach, and global power for America. However, after more than 25 years of sustained combat operations and years of constrained budgets, it has become more difficult to achieve our mission.

The President's fiscal year 2016 budget and the budget levels there take some steps to improve the situation. But our ability to meet the objectives of the national defense strategy is increasingly at risk. The President's budget levels work to maximize the contributions of our total force, Guard, Reserve, and Active; reinforce investments in nuclear deterrents and space control operations; emphasize global long-range and non-permissive capabilities; and preserve the Air Force's top three procurement programs, the F–35, the KC–46, and the long-range strike bomber.

It also gives us the ability to halt reduction us in total force end strength and relieve pressure on our most important weapon, our airmen, continue efforts to regain full-spectrum readiness, and lay the groundwork for future innovation efforts with seed investments.

After subtracting pass-through, the Air Force share of the 2016 defense budget is roughly 22 percent. Within this share of defense resources, the Air Force submission attempts to balance risk driven by shortfalls in capacity, readiness, and modernization that you describe well, Mr. Chairman, to provide global vigilance, reach, and power in support of the defense strategy both today and in the future.

Shortfalls in capacity mean we must accept some risk in our ability to do everything we are expected to do. And the first of many difficult capacity decisions is the decision to divest the A–10. There is no question that the A–10 has been a steady and stellar performer in recent conflicts. Nevertheless, our current force structure is simply unaffordable in today's fiscal environment.

Consistent with fiscal year 2015 Department of Defense guidance to accept risk in current force structure and favor multi-role aircraft to satisfy Defense Strategic Guidance, the fiscal year 2016 Presidential budget again reflects the hard choice to divest the A–10. Divesting the entire A–10 fleet frees up $4.7 billion across the Future Years Defense Program [FYDP], providing funding for priority capacity, capability, and readiness needs.

Next, budget realities have forced the Air Force to make the decision to reduce the EC–130 Compass Call fleet by nearly half after fiscal year 2015, providing a $470 million savings across the FYDP that we have applied toward enterprise capability upgrades.

While the Air Force will maintain essential capabilities to support current combat operations, this decision is not without risk. Once the fleet size drops to eight aircraft in fiscal year 2016, we will only be able to support our current operational obligations.

We face another significant capacity challenge in preferred munitions, for 3 years of constrained budgets have left the Air Force thousands of weapons short in both air-to-surface and air-to-air weapon inventories. To begin to address these munitions capacity shortfalls, the fiscal year 2016 President's budget provides $1.8 billion in fiscal year 2016 and $7.3 billion over the FYDP to increase procurement rates.

As we attempt to balance these capacity demands, we continue to face shortfalls in readiness that are the result of previous funding gaps and sustained high operations tempo. The strain on training programs, weapon systems sustainment, and deployed-to-dwell rates directly impacts our ability to provide fully mission-ready units to the combatant commanders. These readiness shortfalls continue to exacerbate the capacity shortfalls.

In addition to shortfalls in capacity and readiness, the Air Force faces shortfalls in critical capabilities. This means potential adversaries are closing the capability gaps that separate the U.S. military from potential foes. And this narrowed capability gap adds future risk to both mission and forces.

The Air Force's fighter fleet is approaching an average age of 30 years, the oldest in the history of the Air Force. The fourth generation F–15s and F–16s that comprise the majority of our fighter fleet require upgrades to both extend their lifespan and provide the combat capability required to prevail in today's increasingly contested environments.

The advanced capabilities of our fifth generation fighters, the F–22 and F–35, are critical to ensure our ability to fight and win in contested environments. And divesting the A–10 allows us to invest $4.9 billion across the FYDP in F–16 and F–15 modernization and service life extensions, and $600 million across the FYDP to ensure we maintain the operational superiority of the F–22 against rapidly improving threats.

The multi-role F–35A is the centerpiece of our future fighter precision attack capability. It is designed to penetrate air defenses and deliver precision-guided munitions in an increasingly contested threat environment. The FY16 PB includes $6.7 billion for procurement and development of 44 F–35As.

Two decades of continual operations, coupled with constrained and unstable budgets, have taken their toll on our Air Force and our airmen. In anticipation of even greater challenges, we have developed a strategy-driven, resource-informed plan to guide the way our service organizes, trains, and equips to prepare for future operations. Our revised strategic planning and programming process will look beyond the FYDP, out to 20 years into the future, allowing us to identify and shape decisions in advance to provide agile and adaptable weapon systems and processes.

Our fiscal year 2016 budget takes steps to balance the many challenges we face in capacity, capability, and readiness. Any return to sequestration-level funding will directly impact all three areas, leaving us smaller, less ready, with less of an advantage over our potential adversaries.

Thank you, Mr. Chairman, ladies and gentlemen of the committee, for your continued support of our Air Force and the opportunity to discuss with you as we work together to face these challenges.

We look forward to your questions. And with your permission, I will yield to my colleague, Major General Ray, for a few comments.

[The joint prepared statement of General Holmes and General Pawlikowski can be found in the Appendix on page 67.]

STATEMENT OF MAJ GEN TIMOTHY M. RAY, USAF, DIRECTOR OF GLOBAL POWER PROGRAMS, OFFICE OF THE ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION, HEADQUARTERS, U.S. AIR FORCE

General RAY. Thank you, Chairman Cook, and members of the committee. My apologies for General Pawlikowski's inability to make it here today. So I will be testifying on her behalf.

It is an honor to be here. And I thank you for the opportunity to testify before the committee on the subject of aircraft modernization, an area that is critical to the future of our Air Force and our Nation. It is also an honor to share the witness table with my fellow airmen—Lieutenant General Holmes, and certainly, my colleagues from the Department of the Navy.

General Holmes described for you the challenges the Air Force faces in achieving our mission with years of constrained budgets. He shared with you the choices we made to balance capacity, readiness, and modernization. I would like to focus my remarks on modernization.

Given the current budget realities, we must make wise fiscal decisions that allow us to remain the premier air force in the world. These decisions must include how best to modernize the existing fleet, while sustaining our ability to keep the aircraft development programs we have on record on track.

Now more than ever, we must continue investing in the science and technology in modernizing our capabilities. Our fiscal year 2016 budget reflects the Air Force priorities in these areas. Our Air

Force fighter force modernization continues to place a priority on continuing the development of the F–35, and the fiscal year 2016 budget requests a purchase of 44 aircraft.

The budget also includes modernization efforts for the F–22 for improved air-to-ground capabilities and capabilities to counter the advancing threat with improved electronic protection and air-to-air missile capabilities. We will also invest approximately $2.2 billion across the FYDP for the F–15 fleet. This includes service life extensions, integration of the latest precision weapons, and greater modernizations. For the F–16, we will invest approximately $1 billion across the service on the service life extension, operational flight program enhancements, and upgrades to the mission processors.

We have also included recapitalization of the Joint STARS [Surveillance Target Attack Radar System] fleet and continue the combat rescue helicopter. Another focus area is our effort to overcome shortfalls in our munitions inventories, as General Holmes mentioned.

The fiscal year 2016 President's budget makes important investments in science and technology [S&T]. We continue to focus our S&T investments on technologies that will enable us to modernize our capabilities while exploring game-changing technologies for the future. The current global security environment is more complex, dynamic, and uncertain than ever before. Our adversaries are developing technologies and capabilities that attempt to shape and deter our Nation.

We recognize we cannot maintain our edge through technology alone. It will require fresh thinking, innovation regarding how we acquire and manage our acquisition process. The Air Force strategic vision, "A Call to the Future," speaks to our need for strategic agility, which means our modernization efforts must provide us the ability to rapidly act.

Toward that end, our acquisition enterprise is pursuing agile techniques, such as open systems, modularity, designing in resiliency, prototyping and experimentation. In particular, we will capitalize on these techniques in the Joint STARS recap and our new trainer, the T–X.

Finally, we will continue our focus on affordability. Affordable systems are critical to providing the right balance between capacity and modernization. In conclusion, our modernization efforts are critical to the future of the Air Force. We believe that we have made prudent investments in modernization, while continuing a strong science and technology investment. We must constantly strive to be better stewards of taxpayers resources, making every dollar count in achieving maximum buying power for our investments.

We must continue to institute service-wide efficiencies that will capitalize on innovative concepts, keep weapon systems on track, and build affordability into new systems.

Mr. Chairman with your committee's help, working together, we will remain the world's greatest air, space, and cyber force. We look forward to your questions. Thank you.

Mr. COOK. Well, I want to thank the panel very much.

And at this time, I would like to welcome the ranking member, Ms. Sanchez, who has joined us. And she has an opening statement, I believe.

STATEMENT OF HON. LORETTA SANCHEZ, A REPRESENTATIVE FROM CALIFORNIA, RANKING MEMBER, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Ms. SANCHEZ. Thank you, Mr. Chairman. So nice to have a Californian chairing today. I am sorry I was late, gentlemen; I was doing the C–SPAN show this morning and didn't get over in time.

This year's budget is up significantly for all three services compared to fiscal year 2015. In the Navy, we have a $1.3 billion increase above 2015 levels. In the Air Force, a $3.2 billion increase. Of course, this is all going to depend on the whole process that we have here in the Congress and where we end up. Also, with respect to sequestration, what goes on there.

In addition to increased funding, the Air Force has deferred the potential retirement of a number of intelligence, surveillance, and reconnaissance aircraft. We see the E–8 Joint STARS, the E–3 AWACS [Airborne Warning and Control System], and the U–2 aircraft have all been postponed until after 2019.

The Air Force also has increased funding sustainability for MQR Reaper unmanned aircraft. But I also want to note to our committee that you—the services also made some difficult choices. I see that you are still proposing to retire the A–10 over the next 4-year period in an effort to save about $4 billion. And the Navy has not requested additional production of the F/A–18 Super Hornets. And it has cut 16 F–35C aircraft over its 5-year budget.

So I look forward to hearing from you how you came to those decisions and what that—whether that really needs to stay in place in order for you to get to where you think you need to be.

Both services have also requested increased amounts of funding for aerial munitions of almost all categories; traditional bombs, long-range precision-guided missiles, et cetera. I would also like to point out that many of these aerial weapons programs are actually performing very well. And they are under cost, they are in schedule, and they are on performance targets. So that is a good thing.

For example the, AIM–120D and the the AIM–9X Block II air-to-air missiles have emerged from operational testing with outstanding results. I mean, there is some good news in what you all are doing. Both programs are critical to maintaining U.S. air superiority in any future conflicts, so it is important to get them right.

It is also worth noting that these are joint programs between Air Force and Navy. And I also like to see when that happens. Because hopefully over time, maintenance and operation is also lowered.

We are going to have in April a hearing on the F–35 program, obviously. It is the big elephant in the room in so many ways. But I think it is still relevant to the overall topic today of the budget. And while I know that we need the F–35 program, it is the only production plane that we have for our future that we have got, there are still some concerns about the developing—the development and the timing and the testing of this aircraft.

I am worried about the serious engine fire that we had last year. It is a concern because there is just one engine that we have. And

so we need to get to the bottom of what happened. Hopefully, it was just an isolated incident. But we need to figure that out.

And secondly, the F–35 is entering one of the—what I think is one of the most difficult stages, and that is where we see all the software and the integration and everything come together. And this fusion is incredibly important and, from what I am hearing, may not be going as well as we had hoped. So I hope you will enlighten us a little bit where you can on that.

So the engine and the software, very, very critical pieces of making sure that we get this aircraft going and online and tested and flown and, you know, for the future of not only our services, Mr. Chairman, but I have talked to a lot of our international partners who have signed up for these aircraft. And they are constantly asking me are we going to get this done.

So I appreciate the time. And I look forward to the answers today.

Mr. COOK. Thank you, Ms. Sanchez.

General Davis, a report on Monday of this week by Bloomberg said that flight testing of software essential to delivering the plane's promised capabilities was supposed to be completed last month, but now may take until mid June. And that deficiency will be fixed later this year and aren't severe enough to delay the Marine Corps' declaration.

General Bogdan is quoted as saying the service understands the limitation and has operational workarounds to ensure they have the capability they need. What are those limitations, and what is the operational impact if the Marine Corps declares its F–35 initial operational capability this summer?

General DAVIS. Mr. Chairman, thanks for letting me answer.

First off, the F–35 for us, for our Nation, for our Marine Corps, is going to give us a fifth-generation, first-day capability, the ability to go take off from amphibious ships and also land on 3,000-foot ships. So wherever our marines are fighting, they get the—a great combat capability. In a lot of ways, more than—a lot more than we have today with our legacy fleet.

I will answer a couple things. And actually, if I could, to Congresswoman Sanchez's question, as well, on the engine. Because I think that is applicable as well. The engine we are seeing right now is very reliable. We got 10,000 hours on the motor. We did have one problem last summer that we believe we have corrected. I talked to the pilots and the squadron commanders who were flying this airplane last night. A very reliable motor from our perspective, to include the lift fan.

On the fusion capability, we talked about—and the software capability you talked about—we are seeing—we are tracking about 13 different categories inside our program to make sure that we have got this thing on track. From the fusion, in the software, we are actually seeing what we need and tracking for what we need to declare initial operating capability in July of this year.

We still have more test points to get. We take it to the ship in May. And we won't declare IOC until we have all those conditions met for this airplane. But on the software side, one of the complaint—one of the things is four-ship fusion. We do have some issues right now with four-ship fusion. That is four airplanes in the

missionary data link that would share information together real-time.

What we don't have—we found out we do have a problem with some latency with the four-ship fusion. But we do not have a problem with two-ship fusion. So right now, ship one and two and ship three and four can share information very, very readily. It is something we can't do today. So it is a combat capability we don't have today that we do have now with this airplane. And we are sharing information between the first section and the second section through Link 16. That is working very well for us.

The close air support [CAS] software is actually working very well. We are able to, by working through the APG–81 radar, take a bomb through the clouds, which we can't do right now. So doing close air support through the clouds. We are able to take voice nine-line briefs. And also, with our 2B software on-track for a VMF [variable message format] data link to basically take the CAS briefs through the VMF.

The software through the EOTS, which is our Electro-Optical Targeting System, is allowing us to actually do night close air support, track moving targets, and also have better fidelity than our FLIR [Forward-Looking Infrared radar], than our LITENING Pod in our legacy aircraft right now.

So many—the ALIS [Autonomic Logistics Information System] system, we talked about the software as well, again, that is tracking as per what we need for an IOC. With one workaround, which is a—requiring a human, a contractor, to use a laptop computer for the propulsion system modifications. The mission data files, we will know more on that. We just got our first area of responsibility on data load now. And we are going to test that this—this month out at the weapon school out in Yuma, Arizona. So we are going out there. I will be out there tonight. But our pilots will fly for 30 days testing that mission data file.

So on the software side, what we are seeing—and I talked to the squadron commanders and the guys that were flying it last night in preparation for today's testimony to give you ground truth with the pointy end of the spear. They are very, very comfortable with what they have got right now. As good marines, they would always want more. But we are seeing actually an improved combat capability from what we have in legacy today, much better. And we think we have got a good software load, stable software load for this airplane to declare an IOC.

Mr. COOK. Thank you. I was gonna throw it open to the panel, whether they wanted to also address the issue of the single engine. And Ms. Sanchez also raised some other subjects. So we can break it down right now. If anybody wants to jump in right now, feel free.

Admiral GROSKLAGS. Sir, I will talk real briefly about the engine and without diving too far—it is on. Yes. I will speak louder.

I will touch on the engine. But I don't want to take too much time to dive too deeply into the technology piece. But that occurred last summer. We had a—we very quickly identified the root cause. There was two components rubbing on each other internal in the engine, created a lot of heat, and thus a failure. That root cause was identified.

Some restrictions were put on the fleet while we searched for corrections to that. We have essentially two temporary fixes in place today that allow the fleet to continue to fly across all type model series. Depending on the degree of the correction they have had, equates to the amount of flight envelope that they are able to utilize.

The long-term fix is still being worked with Pratt & Whitney, the engine manufacturer. But other than the, I will call it temporary disruption to our test program, where we had to basically stop flying for a few days and then bring things back on slowly. As General Davis noted, the aircraft are back flying. They are flying real-world-type training missions. And the engine is performing the way we expect it to.

General HOLMES. Thank you, Mr. Chairman. I think General Davis and Admiral Grosklags did a great job of describing the progress, both in the software and the engine issue. I would just note that the investigation into the engine was something new for us as we worked together among the three services and the partners to make sure that everybody knew what was going on, that everybody was aware of what we were finding, and that everybody was involved in the decision.

So we did a joint safety board and a joint accident investigation board that let us all understand where we were in the process and be able to adjust. It has had a little bit of an impact in delay on testing program. Because when we temporarily grounded the aircraft and reduced their flight envelope as we worked through the issues, it delayed some of the test points.

The JPO [Joint Project Office] has been dedicated to supporting the Marine effort to reach IOC. And we are happy to help with that effort. We know that they plan to reach it first, and we have worked together with them to do that. And we look forward then to progressing toward our IOC sometime next year then.

Mr. COOK. Thank you. Mr. Norcross.

Mr. NORCROSS. Thank you, Chairman. Appreciate the time. And welcome to the panel. Certainly appreciate your service.

I was recently down in Pomona near Atlantic City visiting our unit there, the Air National Guard, and they are running F–16s out of there. And time after time, their fliers and certainly the mechanics were asking me about the potential upgrades to the radar system. I am not sure General Ray or Holmes, who is better able to address that.

What is the schedule for that? They certainly are at wits' end waiting for that upgrade, which they had indicated been postponed several times. Thank you.

General HOLMES. So thank you, sir, for that question. With your permission, we will both answer a couple of parts of it.

So we canceled the CAPES program, as the chairman said, because it was unaffordable at our current budget level. We have received, as I am sure you know, a joint urgent operational needs request from USNORTHCOM [U.S. Northern Command] to take a look at how we might rapidly equip the F–16s that defend our Nation with advanced electronically scanned antenna radar, with an AESA radar that provides increased capability to those airplanes.

As we look at that the request, that is important for that organization, but it is also part of an entire kill chain that would have to be in place to be able to let it operate. So you need both the sensor on the airplane, and then you need a surveillance system that would help you detect the kind of small cross-section threats that AESA radar gives you capability for, and you need the command and control system to be able to do it.

Those elements are falling in place here in the National Capital Region. And we expect to try to move forward to provide a rapid capability there first, and then see how we would expand it across the country. And I will ask General Ray to talk about the details of that timeline and process.

General RAY. Good morning, sir. Thank you for the question.

We are looking very closely at the capabilities that are required. We take this mission very seriously, defending the Nation's skies. Looking at the F–16 and the options that we have in front of us, we want to make very clear in our minds that we are not limiting the capabilities in any efforts that we take on.

So any of the capabilities that are out there now, existing radars, our ability to integrate that completely and to make a complete upgraded aircraft, is a very lengthy period of time. So to meet the UON [urgent operational need] timelines, which is in the next 18 months, we have to look at putting radars on the airplanes. But we may lose some capabilities over what we actually have right now. So we want to strike the very careful balance between bringing on what we require for this specific mission and not making the capabilities of the airplane less.

Now, we believe that we should have a decision here in the next month or two in terms of exactly how we will do that. We are looking at a couple of options in terms of how we would acquire that. And certainly, there are several different amounts of capability that we can add over time. I believe that we should have a pretty good schedule here in the next 1 to 2 months that would describe how we will get after this problem.

I think that, as General Holmes mentions, the National Capital Region is the easier part in terms of the entire kill chain. We remain concerned about the coverage for the rest of the country and the rest of the F–16 fleet. So I think that makes us focus very close here to the Washington, DC, area and what we need to cover this area with the follow-on effort to go think through how best we will equip those airplanes in the future.

Mr. NORCROSS. Appreciate your answer. We are trying very much to give you your needed predictability. Obviously, yesterday was the first step in a process that hopefully at some point before the end of this year gives you the predictability you need. I would suggest to you that that unit, they need predictability. Obviously, you know the area that they cover between New York and DC is vital. And certainly, they have a history that they remember very much as to the people who live along there. So anything you can do to expedite that, we would appreciate. Thank you.

Mr. COOK. Thank you. Yes, Ms. McSally.

Ms. MCSALLY. Thank you, Mr. Chairman.

Thank you, gentlemen, for your time today and your testimony. Really appreciate it.

General Holmes, wanted to follow up on the discussions on the A–10. Last cycle you stated—or the Air Force stated—there was a savings of $4.2 billion to divest in the A–10. And today you said $4.7 billion, and then another time $4.9 billion. Can you just confirm what the number is?

General HOLMES. Yes, ma'am. Thank you. The number is $4.7 billion, is what we are bringing this year.

Ms. MCSALLY. Okay.

General HOLMES. $4.2 of that is O&M [operation and maintenance] savings and $500 million of it is cost avoidance on wing upgrades.

Ms. MCSALLY. Okay. Great. Thank you. And can you confirm that this is primarily a budget decision, and not a capabilities decision?

General HOLMES. Yes, ma'am.

Ms. MCSALLY. Okay. Great. Thank you. And can you, just for everybody's awareness, give a rundown of a typical combat load of the F–35, standard combat load?

General HOLMES. Yes, ma'am. When the F–35 reaches its initial operation capability, it will have the capability to carry internally two air-to-air weapons and two air-to-grounds weapons. When it—it will have the radios and the digital communications to be able to communicate with folks on the ground. When it reaches its FOC [full operational capability], then it will have the ability to carry heavier JDAMs [Joint Direct Attack Munitions], to be able to carry the SDB II [Small Diameter Bomb II], to fire its internal gun, and be able to carry external ordnance on the wings, as well.

Ms. MCSALLY. Okay. Great. And so internal and external ordnance on the wings would be a standard combat load at FOC?

General HOLMES. At FOC, yes, ma'am. It will have that capability depending on the threat. And if the threat allows it to, then it can carry ordnance on the outside as well under the wings.

Ms. MCSALLY. And how many bullets are in the gun?

General HOLMES. I think it is 250. I would have to——

Ms. MCSALLY. I think it is 180, actually. That is one trigger pull on the A–10, just so you know. And we got plenty more that—and the standard conventional load on the A–10, I am sure you know what this is. I mean, we got over 1,150 rounds, plus a variety of other weapons that we can carry.

So if you—I mean, if you had the resources, do you agree that there are situations, combat situations on the ground that the A–10 would be best suited in order to save lives?

General HOLMES. Yes, ma'am.

Ms. MCSALLY. Great. Thank you. And then switching to the EC–130. So that—you know, the Air Force is divesting in the A–10, EC–130, both stationed at Davis-Monthan and both in my district. I won't take that personally. But obviously, I am concerned about—concerned about losing that capability.

So you mentioned in your testimony, but I just want to confirm the plan or the desire is to cut the fleet basically in half this fiscal year. But can you confirm, is there another capability in our Air Force that can do what the EC–130 does?

General HOLMES. There are areas where the EC–130's capabilities overlap with other capabilities that are there. But there are

certainly things that only the EC–130 does or that the EC–130 does best.

Ms. MCSALLY. Right. And the EC–130s right now are deployed both to Afghanistan and in the fight against ISIS [Islamic State in Iraq and Syria], correct?

General HOLMES. Yes, ma'am.

Ms. MCSALLY. Great. And so we have nothing to replace it for some unique capabilities they have. They are deployed at a pretty high rate. You know, they have been deployed continuously for a long period of time, yet we are going to cut that capability in half.

Is there anything in development that is going to be replacing the EC–130?

General HOLMES. We are considering some options to do that. As you know, we are embarked on a program to upgrade our JSTARS and replace the JSTARS aircraft. Depending on how that program goes, we think it might offer some options for a re-hosting of the EC–130 electronics, as well. We are looking at options where we could take the existing electronics from the EC–130 and re-host them on another platform that would offer some performance advantages and be cheaper to operate in the future.

And we will kind of see how that JSTARS program goes, and then see if we are able to adapt that approach to some of our other weapon systems.

Ms. MCSALLY. Okay. Thank you, sir. Do you—can you give me the number of what savings you project you would have by cutting the EC–130s in half this fiscal year? What is that number, do you know? You don't have to—I mean, if you could just get it to me, I don't need it right now.

General HOLMES. Yes, ma'am. It is roughly $470 million across the FYDP.

Ms. MCSALLY. Okay. Great. If you could give me the fiscal year 2016 number, that would be great.

General HOLMES. Yes, ma'am.

[The information referred to can be found in the Appendix on page 97.]

Ms. MCSALLY. So I am sure you can appreciate that we have said there is a unique capability that the EC–130 brings, that we don't have another capability yet. We don't have anything necessarily under development to replace it, yet we are cutting it in half. I mean, can you—do you appreciate that that logic is concerning to those who want to make sure that we can protect the warfighters that are deployed?

General HOLMES. Yes, ma'am, I do. And our problem is that I don't have enough money to do all the things that I would like to provide for warfighters. And I have to make decisions within that. There are many areas that I have limits placed on where I can go to achieve savings, particularly in capacity, from Congress and from the Department. And so I am limited in the places that I can go when I have to go to capacity to save money.

Ms. MCSALLY. Okay. Thank you.

I yield back.

Mr. COOK. Thank you. Ms. Sanchez.

Ms. SANCHEZ. Thank you, Mr. Chairman.

Gentleman, I want to talk about the F–18. So the Navy, its testimony and also provided to this committee information that says by 2020 you will be short 100 F–18s. And you also said that this number is due to grow because of some particular factors.

So in looking back at the materials that we have had before this committee before, all the way back to 2009, we show a different shortfall every program year. For example, in 2009, the projection was 125 aircraft. A year later it was 145. In 2011 it was 177. In 2014 the shortfall was only 18 aircraft.

So can you—can you tell me the credibility when I see, you know, 18 to 100—I mean, that is kind of a bit loose and three, four, fivefold difference. Why is that, and what am I not seeing here? Do we just think that 90—no, 82—planes will fall out of the sky this year? Or where are we going with this? Why are the numbers so dramatically different? Are we guessing, do we really have ways in which we are trying to figure this out?

And it appears to me that the Navy has a—has a throughput problem, not a lack of aircraft, in terms of numbers. And as a result, should Congress be focusing on better funding the depot operations, rather than just buying more planes to put through the same—rather than to put them through inefficient depot repairs? What is going on here? What is the approach we need to be thinking about here?

Admiral MANAZIR. Yes, ma'am. Thank you for the question. And it is a great opportunity to be able to address naval aviation here. I enjoyed the opportunity to chat with you last year about kind of the same topic.

So I would like to discuss our strike fighter inventory management. From the depot throughput of our F–18A++s and Charlies, Bravos and Deltas, through the sustainment and eventual extension of the F–18E/F, which is going to occur in the middle of the 2020s, to the procurement of F–35C.

Given that there are two hotlines, the F–18E, F, and G hotline in Saint Louis and the F–35A, B, and C hotline for the Department of the Navy, that would be the Bravo and the Charlie models down in Fort Worth, we have wonderful opportunities to recapitalize our force.

The—certainly, the 2016 President's budget has increased risk in our ability to sustain our inventory managements. But to your point about numbers, we have a very, very precise model. And it is so precise that when you change an input, it will tell you exactly where your shortfall exists and in what year and how many.

And so since 2009, I have been involved in this process, either as part of the solution, but mostly probably part of the problem. And as the—in this position as the director of air warfare, we closely manage that inventory shortfall.

The chairman correctly described the manageable shortfall of 65 airplanes. In the United States Navy, we tier our readiness. We don't keep our readiness at the top level. That means we don't need all of the airplanes all of the time. We only support the deployed units at the top level. So we can manage with 65.

When we have a shortage over the next 5 years of about 100 aircraft, that tracks to the CNO's [Chief of Naval Operations'] statement that he would like to have two to three squadrons to reduce

the risk in our inventory management of F–18s, because that is an additional 35 aircraft to the hundred you talked about.

When you look at the strike fighter inventory management piece, use the word "shortfall," that is a conclusive word that says I know what the supply is, I know what the demand is, and I know what my usage rate is; therefore, the formula says I have a shortfall and it is 135. That is if you leave everything identical. You don't change the supply, i.e., depot throughput in the near-term.

So let's talk about that for a second. I want to make the depot more efficient. When we started to project the work that needed to be done to extend the service life of the F–18C from 6,000 hours inspected to 8,000 hours of service life and now going to 10,000 hours, a 67 percent increase, we expected to do structural work on the airplane. What we did not expect is the amount of corrosion we found inside the airplanes, deep inside the airplanes, that were from years and years of use in austere environments on land, and then also in the salt air environment on the carriers.

That corrosion control work was not having to be accomplished if we stopped flying the airplane at 6,000 hours. That also added work to the depots. We used a lean process in manufacturing to get the work done based on programmed work. The problem is that corrosion added unplanned work. And so the depots have now had to go to a theory of constraints. And they are very good at looking at the capacity we have in the depots. Use a theory of constraints method called critical chain project management.

In FRC [Fleet Readiness Center] Southeast in Jacksonville, Florida, and in FRC Southwest at North Island, Coronado, California, they are putting a new process in place. Such that, for instance, we looked at our depot throughput and it was noted that our depot throughput needs to improve, we assumed that the depot, with all of its resources, you can put 17 airplanes through the depot at any one time. So you have 17 airplanes that work. An analysis using theory of constraints——

Mr. COOK. Gentlemen, I don't mean to interrupt. But I am going to ask that you kind of shorten your answers, because we had a quorum called and then 15 minutes and then we are going to have to have votes. So everyone else, if you could kind of make it shorter. Okay? As I said, I apologize and I——

Admiral MANAZIR [continuing]. Strike-fighter inventory management is very complex. Difficult short answer. Let me just do this. We got a new process in place. It is going to be more efficient. We are going to turn this around and get those airplanes. Then we are going extend to Es and Fs. And we still have the opportunity with two hotlines to be able to use that to reduce the risk.

Procurement of F–35C is the other end. As we discussed, the Navy and the Marine Corps have to get the F–35C to win. I hope that answers part of the question.

Ms. SANCHEZ. Well, we will discuss it out of committee. Thank you.

Mr. COOK. There is going to be a test after this. We will see if you pass.

Mr. Knight.

Mr. KNIGHT. Thank you, Mr. Chairman. I will try and keep my comments a little brief and just allow you to answer. To the Navy,

I haven't heard anything about the Growler program. Are we on stage there, are we needing more Growlers, especially as the F–35 comes online a Growler is going to be a very useful tool with the F–35.

Admiral MANAZIR. Yes, sir. As the Department of Defense's only airborne electronic attack airplane, that is true. Very useful. We integrate our capabilities with the stealth characteristics of the F–35C and the electronic capabilities of the Growler. We get a very, very good integrated piece.

We have 153 Growlers. That is satisfactory for the Navy mission. We are embarking on a study, as the Chief of Naval Operations said, to evaluate the number we need for the joint mission going forward. The line still being open in Saint Louis keeps our options open.

Mr. KNIGHT. Good, good. Thank you, sir.

To the Air Force. You know, we are in a stage where it is not first-sight, first-kill, it is actually first-shot, first-kill with the fifth generation fighters.

And with the Aerospace Innovation Initiative and of the change to the X-plane, oh, platforms over the last 20 years, do you see us still moving into an era we are going to—we are going to fly the wings off a fighter for the next 50 years, and then try and go on to the next generation and then fly the wings off it for 50 years, instead of moving more toward bringing in today's technology about every 15 years, as we used to do?

General RAY. Yes, sir. Thank you for that question. The short answer is that we have realized how difficult it is to make these very lengthy aircraft programs, just as you mentioned. We have done a lot of thinking about this. And we do believe that there is a very clear need to move to a capabilities-based development.

Recent efforts in the Air Force have been chartered by the Secretary and the Chief to allow us to take a very bold look at how we maintain air superiority in 2030. And the mindset there will be to build a learning campaign on how to aggregate the capabilities that we have and to put the technologies in play that will keep the air-to-air kill chain resilient in 2030 and beyond.

We think that there is a tremendous amount of learning, experimentation, and prototyping that has to happen to make that a reality. Mr. Kendall's aircraft innovation initiative is a piece of that. That is a touch point for both the Navy and the Air Force.

But for the Air Force's role in that particular piece, we are going to take a much broader look at how we do this as an Air Force, as an enterprise, as a family of systems. Certainly, there will be something that flies, something that will be in the battlespace. Exactly how we do that is not defined.

But we know we need to bring the technologies that we are going to have to play, not the technologies that we want. So it will take a great deal of collaboration and learning to do that in time.

Mr. KNIGHT. Thank you, sir. And I will say one compliment to the F–35. It is doing very well at Edwards Air Force Base and hitting—hitting its test points. And almost overachieving in many of the areas that they didn't think it would.

So—but my last question, Mr. Chair, with your indulgence is——

Mr. COOK. Quick.

Mr. KNIGHT. We are going into an era where the airframe is going to be the biggest deal. It is not going to be the speed and the armament. It is going to be the airframe. And you can't change the airframe. So if we keep that airframe for 40 or 50 years, we are stuck with it. And that is the change to innovation of how we see the aircraft, how the aircraft can get into enemy lines. And that will be my continued question as we move through this process.

Thank you, Mr. Chair.

Mr. COOK. Thank you. Mr. Veasey.

Mr. VEASEY. Thank you. Thank you, Mr. Chair. I want——

Mr. COOK. And they have counted—called votes.

Mr. VEASEY. Oh, they have called votes. Okay. I will be just really quick.

I just wanted to ask particularly about the inventory, the Joint Strike Fighter inventory. I know that we have heard testimony about the strike fighter shortfall of two to three squadrons, is two to three squadrons worth of aircraft. And is the Navy strike fighter inventory sufficient to support operational demand?

Admiral MANAZIR. Sir, thank you. I will refer to the answer I gave to ranking minority member as for the inventory management.

The F–35C numbers that the Navy and the Marine Corps needs are not being procured in the numbers that we need to go into the future. The President's budget from the United States Navy and United States Naval Aviation had to defer 16 F–35Cs out of it for fiscal reasons and priorities of the Department.

We use 35 to 39 strike fighters a year just in utilization/attrition. If you are not replacing 35 to 39 aircraft a year, you cannot sustain your inventory into the future. We are looking very closely at that. And we look forward to working with Congress on acquiring enough airplanes to meet our strike fighter needs.

Mr. VEASEY. Lieutenant General Holmes, last question for me. Can the F–35 provide the ground cover that is needed? I know there has been a lot of talk about, you know, the A–10 and the ground cover that it provides. But do you—can the F–35 provide sufficient ground cover in the theater that troops will need without having an A–10 type plane?

General HOLMES. You know, thank you, sir. You heard General Davis talk about how the Marines feel about the F–35's ability to provide close air support. And I think they are comfortable it will be able to do so. I think we are, too. And I think the whole Air Force is involved in the close air support mission and the support of ground commanders. So the F–35 will play a role in that. But it won't just be the F–35. It will be the F–35, the F–15, the F–16, and the whole Air Force enterprise can be devoted to that resource. And yes, sir, we feel confident we can continue to provide that mission.

Mr. VEASEY. Thank you.

General DAVIS. If I could, sir, just to follow up on that from the Marine Corps side. On our inventory, we are replacing F–18s and Harriers that have performed exceptionally well in combat, but they are nearing the end of their service life. So the F–35B and the C—but the F–35B in large numbers for the Marine Corps—is keep-

ing that aircraft on-ramp and keeping that in production is really important to us.

On the—on how we will support the marines on the ground, we got our first-day fight, first 5 days' fight with fifth generation. So we can support a marine in a contested environment, which we can't do as well with our legacy airplanes right now.

The other thing, if I—when I go to Block 3 software, I can actually load 14,000 pounds of external ordnance on the airplane. That is 3,000 pounds more than I could put on my F–18 today. So, great. Taking a lot of ordnance to the marines and soldiers, sailors, where and when they need them.

Mr. COOK. Thank you.

Mr. VEASEY. Thank you, Mr. Chairman.

Mr. COOK. Mr. Graves, last question.

Mr. GRAVES. Real quickly. And Admiral Manazir, you talked about the shortfall. And I am very concerned about this. When we have fewer airframes out there to do the job, we put a lot of operational fatigue on those airplanes. And you talked about this.

And just for the record again, and so I can start working to rectify this, how many airplanes do you need, how many Super Hornets do you need to eliminate that shortfall? How many do you need to procure?

Admiral MANAZIR. Sir, we need to get the F–35Cs at 20 F–35Cs a year in 2020. But the CNO has already testified two to three squadrons of Super Hornets will reduce the risk to a manageable level. That would be 24 to 36 airplanes. And he has already testified to that, sir. I support that number.

Mr. GRAVES. Thank you very much.

Mr. COOK. Thank you very much. You know, I just want to thank the panel. I had to speed up things because of the votes and everything. I had a few questions. They were not five-syllable-word questions. Since I am an infantry officer they were all going to be one-syllable ones. But I am sure I am going to see you again.

And I do, once again, want to thank you very much. We were constrained. We had a lot of people, other committees. And I know you come over here and as I said, I appreciate your patience and indulgence, but most of all for your professionalism and for doing what you do. So stay safe, keep the troops safe, and we all thank you so much.

This meeting is adjourned. Thank you.

[Whereupon, at 9:59 a.m., the subcommittee was adjourned.]

A P P E N D I X

MARCH 26, 2015

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 26, 2015

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

STATEMENT OF

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

AND

REAR ADMIRAL MICHAEL C. MANAZIR
DIRECTOR AIR WARFARE

AND

LIEUTENANT GENERAL JON DAVIS
DEPUTY COMMANDANT FOR AVIATION

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

COMBAT AVIATION MODERNIZATION

March 26, 2015

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TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

INTRODUCTION

Mr. Chairman, Representative Sanchez, and distinguished members of the Subcommittee, we thank you for the opportunity to appear before you today to discuss the Department of the Navy's (DoN) Aviation programs. Our testimony will provide background and rationale for the Department's Fiscal Year 2016 budget request for aviation programs aligning to our strategic priorities and budgetary goals.

The United States is a maritime nation with global responsibilities. Our Navy and Marine Corps' persistent presence and multi-mission capability represent U.S. power projection across the global commons. They move at will across the world's oceans, seas and littorals, and they extend the effects of the sea-base and expeditionary basing deep inland. Naval Aviation provides our nation's leaders with "offshore options" where it matter, when it matters. We enable global reach and access, regardless of changing circumstances, and will continue to be the nation's preeminent option for employing deterrence through global presence, sea control, mission flexibility and when necessary, interdiction. We are an agile strike and amphibious power projection force in readiness, and such agility requires that the aviation arm of our naval strike and expeditionary forces remain strong.

There are several central themes to our 2016 Naval Aviation Budget plan: 5th generation fighter/attack capability; netted persistent multi-role intelligence, surveillance, reconnaissance and targeting; supporting capabilities such as electronic attack, maritime patrol, and vertical lift; advanced strike weapons programs; readiness recovery; and targeted modernization of the force for relevance and sustainability.

First, we are acquiring F-35 5th generation fighter/attack aircraft while maintaining sufficient tactical aviation (TACAIR) inventory capacity. Our plan will integrate 5th generation technologies into the carrier air wing and expeditionary forces while maintaining and modernizing the capability of the current TACAIR fleet. The F-35B and F-35C will replace Marine Corps F/A-18 and AV-8B aircraft significantly increasing

capabilities across the range of military operations of Marine sea and land-based MAGTFs. The F-35C, F/A-18E/F, and EA-18G provide complementary capabilities that enhance the versatility, lethality, survivability, and readiness of our air wings. F/A-18A-F and AV-8B aircraft will continue to receive capability enhancements to sustain their lethality well into the next decade. Future avionics upgrades will enable network-centric operations for integrated fire control, situational awareness and transfer of data to command-and-control nodes.

To meet the demand for persistent, multi-role intelligence, surveillance, and reconnaissance (ISR) capability, the Navy and Marine Corps are building a balanced portfolio of manned and unmanned aircraft focused on missions in the maritime environment. The Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) system will provide a persistent aircraft carrier-based ISR&T and strike capability as an integral part of carrier air-wing operations no later than the early part of the next decade. MQ-4C Triton will provide persistent land-based maritime ISR and complement our P-8 Multi-Mission Maritime Aircraft (MMA); MQ-8 Fire Scout will provide ISR support to our Frigates and other suitably-equipped air-capable ships; and smaller unmanned systems such as the RQ-21A Small Tactical Unmanned Aircraft System (STUAS) and RQ-7B Marine Corps Tactical UAS (MCTUAS) will provide the shorter duration, line-of-sight reconnaissance capability integral at the unit level.

The Fiscal Year 2016 Budget request enables Naval Aviation to continue recapitalization of our aging fleets of airborne early warning, maritime patrol, and vertical lift platforms. The Department is recapitalizing our fleet of E-2C airborne early warning aircraft with the E-2D, maritime patrol and reconnaissance with the P-8A, airborne electronic attack with the EA-18G, and Carrier Onboard Delivery (COD) with the V-22. E-2D integrates a new electronically-scanned radar that provides a two-generation leap in technology with the capability to detect and track existing and emerging air-to-air and cruise missile threats in support of Integrated Air and Missile Defense (IAMD). P-8A combines the

proven reliability of the commercial 737 airframe with avionics that enable integration of modern sensors and robust communications. We have deployed our third P-8A squadron and are on a path to replace the P-3C by the end of the decade. Electronic attack capabilities, both carrier-based and expeditionary, continue to mature with the fielding of EA-18G squadrons while we continue development of the Next Generation Jammer (NGJ) to replace the legacy ALQ-99 Tactical Jamming System. Finally, the Department is planning to recapitalize its fleet of C-2A COD aircraft with an extended range variant of the V-22. The decision closes a capacity gap in the COD capability within an existing program of record.

The Navy and Marine Corps are participating in Joint Future Vertical Lift efforts to identify leverage points for future rotorcraft investment. In Fiscal Year 2016 the Department continues to modernize vertical lift capability and capacity with procurement of MH-60R, AH-1Z, UH-1Y, and MV-22B, and the continued development of the CH-53K and VH-92A (Presidential Helicopter replacement). The Special Purpose Marine Air-Ground Task Force-Crisis Response (SPMAGTF-CR), designed to support U.S. and partner security interests throughout the CENTCOM, EUCOM and AFRICOM Areas of Responsibility (AOR), leverages these vertical lift investments. The unparalleled speed and range of the MV-22B, together with the KC-130J and joint tanker assets provides both SPMAGTF-CR with the operational reach to respond to crises throughout any AOR.

Within our Fiscal Year 2016 Budget request the Department continues investment in advanced strike weapons programs. These include Air Intercept Missiles (AIM-9X/BLK II and AIM-120D); Small Diameter Bomb II (SDB II); Tactical Tomahawk Cruise Missiles (TACTOM/BLK IV); the Long-Range Anti-Ship Missile (LRASM); the Advanced Anti-Radiation Guided Missile (AARGM); the Joint Air-to-ground Missile (JAGM); and the Advanced Precision Kill Weapon System (APKWS II).

These capabilities enable our Navy and Marine Corps warfighters to deter and dominate potential adversaries in any environment.

TACTICAL AVIATION

F-35B/F-35C Lightning II:

The F-35 Joint Strike Fighter (JSF) will form the backbone of U.S. air combat superiority for decades to come. Delivering this transformational capability into front line forces as soon as possible remains a top priority. JSF will replace legacy tactical fighter fleets of the Navy and Marine Corps with a dominant, multirole, fifth-generation aircraft, capable of projecting U.S. power and deterring potential adversaries. The Fiscal Year 2016 President's Budget requests $1.0 billion RDT&E,N and $3.1 billion APN.

The F-35 program is executing well across the entire spectrum of acquisition, to include development and design, flight test, production, fielding and base stand-up, sustainment of fielded aircraft, and stand up of a global sustainment enterprise. To date, all variants of F-35 have flown close to 28,000 hours close to 11,000 hours for the F-35B and more than 3,000 for the F-35C. Our overall assessment is that steady progress is being made on all aspects of the program. However, F-35 does continue to have its risks, inclusive of software development and integration. However, discipline instilled several years ago in the way software is developed, lab tested, flight tested, measured and controlled has resulted in improved and more predictable outcomes.

The program is in the final stages of flight test for Block 2B software; Block 3i software is anticipated to deliver all planned capabilities; and Block 3F, which has the most software development risk driven by data fusion, is improving. Data fusion enables the aircraft to integrate onboard capabilities with information from multiple other sources, such as non-F-35 aircraft, satellites, and ground stations, to provide the pilot complete and accurate battlespace awareness. This multi-platform fusion is the most complex remaining developmental activity and is being closely monitored. Block 3F complexity

and technical challenges, combined with a delay in the start of 3F flight testing may result in delivery up to 4-6 months late. Overall, the Block 2B configuration, which will support the Marine Corps' F-35B Initial Operational Capability (IOC) will deliver during the Summer of 2015 and is tracking to plan; Block 3i, the same capability as Block 2B but hosted on new and improved computers, is expected to be ready by the end of calendar year 2015, and Block 3F capability will enable Navy to IOC the F-35C variant in 2018 along with the Marine Corps its first F-35C in 2020.

The program has delivered 124 aircraft to test, operational, and training sites, with the production line running approximately two-months behind schedule. Due to government/industry manufacturing management initiatives, production deliveries are improving and the current delays do not pose any long-term schedule or program delivery risks.

Affordability remains a top priority. We have made it clear to the program management team and the F-35 industrial base that the JSF must finish development within the time and money allocated; continue to drive cost out of aircraft production; and reduce life-cycle costs. To that end the program has engaged in a multi-pronged approach to reduce costs across production, operations, and support. The government/industry team is reducing aircraft production costs through "blueprint for affordability" initiatives and reducing F135 engine costs via ongoing engine "war on cost" strategies. These efforts include up-front contractor investment on cost reduction initiatives mutually agreed upon by the government and contractor team. This arrangement motivates the contractors to accrue savings as quickly as possible in order to recoup their investment, and benefits the government by realizing cost savings at the time of contract award. The goal is to reduce the flyaway cost of the U.S. Air Force (USAF) F-35A to between $80 and $85 million dollars by 2019, which is anticipated to commensurately decrease the cost to the Marine Corps F-35B and Navy F-35C variants. The program has set a goal of decreasing overall operating and support life-cycle cost by 30 percent.

F/A-18 Overview

The F/A-18 Hornet continues to meet readiness and operational commitments. There are 26 Navy Super Hornet strike fighter squadrons and a total inventory of 521 F/A-18E/Fs; deliveries and squadron transitions will continue through 2018. There are nine Navy and 11 Marine Corps F/A-18 A-D active strike fighter squadrons and a total inventory of 614 Hornets. Super Hornets and F/A-18A-D Hornets have conducted more than 214,000 combat missions since September 11, 2001.

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

The Fiscal Year 2016 President's Budget requests $371.2 million in APN to implement aircraft commonality programs, maintain relevant capability, improve reliability, and ensure structural safety of the inventory of 614 F/A-18 A-D Hornets. $148.2 million is for the Service Life Extension Program (SLEP).

The F/A-18A-D was designed for, and has achieved, a service life of 6,000 flight hours. These aircraft have performed as expected through their design life. Service life management of this aircraft is intended to extend this platform beyond its designed 6,000 flight hours. Through detailed analysis, inspections, and structural repairs, as required, the DoN has been successful in achieving 8,000 flight hours for many aircraft and is pursuing a strategy to go as high as 10,000 flight hours on select aircraft. Continued investment in SLEP, the High Flight Hour (HFH) inspection program, Program Related Engineering, and Program Related Logistics is critical for our flight hour extension strategy.

In order to maintain warfighting relevancy in a changing threat environment, we will continue to procure and install advanced systems such as the Joint Helmet-Mounted Cueing System (JHMCS), High Order Language Mission Computers, ALR-67v3, ALQ-214v5, Multifunctional Information Distribution System (MIDS), APG-73 radar

enhancements, Advanced Targeting Forward looking Infrared (ATFLIR) upgrades, and LITENING for the Marine Corps on selected F/A-18A-D aircraft.

F/A-18 E/F Super-Hornet

The F/A-18E/F will be a mainstay of Navy's aviation carrier air wing strike fighter force through 2035. The Fiscal Year 2016 President's Budget requests $507.1 million in APN to implement aircraft commonality programs, maintain relevant capabilities, improve reliability, and ensure structural safety of the Super-Hornet fleet; and $153 million RDT&E,N to support the Flight Plan spiral capability development, development of Advanced Electronic Attack and Counter-Electronic Attack, and F/A-18E/F Service Life Assessment Program (SLAP).

The F/A-18E/F significantly improves the survivability and strike capability of the carrier air wing. The Super-Hornet provides increased combat radius and endurance, and a twenty-five percent increase in weapons payload over F/A-18A-D Hornets. The production program continues to deliver on-cost and on-schedule.

The Super-Hornet uses an incremental approach to incorporate new technologies and capabilities, to include Digital Communication System Radio, MIDS - Joint Tactical Radio System, JHMCS, ATFLIR with shared real-time video, Accurate Navigation, Digital Memory Device, Distributed Targeting System, Infrared Search and Track and continued advancement of the APG-79 Active Electronically Scanned Array (AESA) Radar.

$19.7 million of the 2016 RDT&E,N supports the F/A-18E/F SLAP requirement. The F/A-18 E/F fleet, on average, has flown approximately 36 percent of the design life of 6,000 flight hours. The remaining design service-life will not be adequate to meet long-term operational commitments through 2035. In 2008 the Navy commenced a three phase F/A-18E/F SLAP to analyze actual usage versus structural test results and determine the feasibility of extending F/A-18E/F service life from 6,000 to 9,000 flight

hours via a follow-on SLEP. The F/A-18E/F SLAP will identify the necessary inspections and modifications required to achieve 9,000 flight hours and increase total arrested landings and catapults beyond currently defined life limits. This extension is assessed as low risk. The Service Life Management Plan philosophy has been applied to the F/A-18E/F fleet at an earlier point in its lifecycle than the F/A-18A-D. This will facilitate optimization of Fatigue Life Expended, flight hours, and total landings, thereby better aligning aircraft service life with fleet requirements.

AV-8B Harrier

Since the beginning of the war on terror, the AV-8B Harrier has been a critical part of the strike fighter inventory for the Joint force. This aircraft has flown more than 54,000 hours in combat since 2003 with zero losses from the enemy in the air but six losses on the ground when the enemy broke through our forces at Bastion air base in 2012. The Fiscal Year 2016 President's Budget requests $83.3 million in APN funds to continue the incorporation of Obsolescence Replacement / Readiness Management Plan systems, electrical and structural changes, inventory sustainment and upgrade efforts to offset obsolescence and attrition, LITENING Pod upgrades, and F402-RR-408 engine safety and operational changes.

The Fiscal Year 2016 President's Budget requests $39.9 million in RDT&E,N funds to continue Design, Development, Integration and Test of various platform improvements, to include Engine Life Management Program, Escape Systems, Joint Mission Planning System updates, Link 16 Digital Interoperability integration, Operational Flight Program (OFP) block upgrades to various mission and communication systems, navigation equipment, weapons carriage, countermeasures, and the Obsolescence Replacement / Readiness Management Plan.

The AV-8B continues to deploy in support of operational contingencies. Each Marine Expeditionary Unit (MEU) deploys with embarked AV-8Bs. The AV-8B, equipped with

LITENING targeting pods and a video downlink to ROVER ground stations, precision strike weapons, Intrepid Tiger II EW pods and beyond visual range air-to-air radar guided missiles, continues to be a proven, invaluable asset for the Marine Air Ground Task Force (MAGTF) and joint commander across the spectrum of operations. One squadron has flown more than 3,400 hours of strike sorties against ISIS with an average combat radius of 900 miles. Digital Improved Triple Ejector Racks have allowed us to load up to 6 precision guided munitions per aircraft, with tanks, guns, and Litening Pods exponentially increasing the combat viability of this platform. In Fiscal Year 2016 the Airborne Variable Message Format terminals will be installed in AV-8B to replace the current digital-aided close air support (CAS) technology. The program will continue development of the H6.2 Operational Flight Program to integrate Federal Aviation Administration compliant Navigation Performance/Area Navigation (RNP/RNAV) capability, an update to the LITENING Common OFP to implement improvements to moving target tracking, and correct additional software deficiencies identified through combat operations. The program will also work on the H7.0 OFP which will integrate Link 16 functionality. As an out-of-production aircraft, the AV-8B program will continue its focus on sustainment efforts to mitigate significant inventory shortfalls, maintain airframe integrity, achieve full Fatigue Life Expended, and address reliability and obsolescence issues of avionics and subsystems.

Operations ODYSSEY DAWN, ENDURING FREEDOM, and today's Operation FREEDOM SENTINEL confirm the expeditionary advantages of Short Take-Off and Vertical landing (STOVL) capabilities. Placing the Harrier as the closest multi-role fixed-wing asset to the battlefield greatly reduces transit times to the battlefield and enables persistent CAS without strategic tanking assets. Airframe sustainment initiatives, capability upgrades, and obsolescence mitigation is essential and must be funded to ensure the AV-8B remains lethal and relevant.

FA-XX

The Department is preparing to conduct an analysis of alternatives (AoA) to address the anticipated retirement of the F/A-18E/F and EA-18G aircraft beginning in the mid 2020 timeframe. The FA-XX AoA will consider the widest possible range of materiel concepts while balancing capability, cost, schedule, and supportability considerations. It will assess manned, unmanned, and optionally manned approaches to fulfill predicted 2030+ mission requirements. Analysis will consider baseline programs of record (current platforms), evolutionary or incremental upgrades to baseline programs (including derivative platforms), and new development systems or aircraft to meet identified gaps in required capability. The Fiscal Year 2016 budget requests $5.0 million in RDT&E,N to conduct this AoA.

Strike Fighter Inventory Management

The Department remains challenged with end of life planning for F/A-18A-D and AV-8B aircraft that reach the end of their service life before replacement aircraft (F-35B/C) can be fully delivered into service. In the Fiscal Year 2016 budget request the Department was forced to cut 16 F-35Cs from the budget (FY 2016- 2020), delaying the stand-up of the first Marine Corps F-35C squadron by one year and delaying subsequent F-35C squadron transitions by two years each. Strike Fighter Inventory Management risk increases with the Fiscal Year 2016 budget request, further increasing the gap between supply and the Department's Master Aviation Plan demand.

The near term inventory challenge is due to a combination of reduced Strike Fighter procurement, higher than planned TACAIR utilization rates, and F/A-18A-D and AV-8B depot facility production falling short of the 2013 and 2014 required output. Aggressive efforts across the Department were instituted in 2014 to improve depot throughput and return more aircraft back to the Fleet. Aviation depots are expected to improve productivity through 2017, and fully recover the backlog of F/A-18A-D by 2019 and Harrier by 2016; at which time the focus will shift towards F/A-18E/F service life

extension. The Marines ran an Independent Readiness Review of their AV-8B program to recover to a T-2.0 readiness level within their AV-8B fleet, meet their operational requirements and ensure they had an adequate bridge to the F-35. By following the plan, the AV-8B fleet should be in the green in 17 months.

The Navy and USMC strike-fighter force continues to meet their operational commitments. However, we anticipate the inventory pressure to remain relatively constant through Fiscal Year 2016 as we experience peak depot inductions of F/A-18A-D aircraft reaching 8,000 hours and entering extensive High Flight Hour (HFH) service life extension inspections, repairs and modifications.

Airborne Electronic Attack (AEA) / EA-18G Growler

The Fiscal Year 2016 President's Budget request includes $108.5 million in APN to implement aircraft commonality programs, maintain relevant capabilities, improve reliability, and ensure structural safety of the Growler fleet; $56.9 million in RDT&E,N for Flight Plan spiral capability development, design and integration of Jamming Techniques Optimization improvements, evolutionary software development and related testing; and $398.8 million RDT&E,N for NGJ Increment 1 and $13.0 million RDT&E,N for NGJ Increment 2.

In 2009, the Navy began the transition from EA-6Bs to EA-18Gs. The EA-18G is a critical enabler of the Joint force, bringing fully netted capabilities that provide electromagnetic spectrum dominance in an electromagnetic maneuver warfare environment. The first EA-18G squadron deployed to Iraq in an expeditionary role in November 2010 in support of Operation NEW DAWN, and subsequently redeployed to Italy on short notice in March 2011 in support of Operations ODYSSEY DAWN and UNIFIED PROTECTOR. The first carrier-based EA-18G squadron deployed in May 2011. Three active component Navy expeditionary squadrons, nine of ten carrier based squadrons, and one reserve squadron have completed, or are in, transition to the EA-18G.

The 10 carrier based EA-18G squadrons will fulfill Navy requirements for airborne electronic attack; six expeditionary EA-18G squadrons will provide the joint, high-intensity AEA capability required by the Joint Forces Commander, which was previously fulfilled by the Navy and Marine Corps EA-6B. The Navy will be divested of EA-6Bs by 2015; the Marine Corps by 2019 leaving the E/A-18G as the only viable AEA platform in the DoD inventory. The inventory objective is 153 EA-18G aircraft. Since their initial deployment, Growlers have flown more than 2,300 combat missions, have expended approximately six percent of the 7,500 flight hour life per aircraft, and are meeting all operational commitments.

Next Generation Jammer (NGJ)

NGJ is a new electronic warfare capability that will replace the 42-year old ALQ-99, currently the only Navy and Joint airborne Tactical Jamming System pod. The ALQ-99 has limited capability to counter tactically and technically advanced threats, is increasingly difficult and costly to maintain, and has a vanishing industrial supplier base. The Navy and Department of Defense (DoD) require NGJ to meet current and emerging EW threats. NGJ will have the necessary power and digital techniques to counter increasingly advanced and sophisticated adversary electronic warfare search, surveillance, and targeting-radars and communications systems. NGJ will be DoD's only comprehensive tactical AEA capability - supporting all Services and joint/coalition partners, and will be implemented in three increments: Mid-Band (Increment 1), Low-Band (Increment 2), and High-Band (Increment 3). NGJ is designed to provide improved capability in support of joint and coalition air, land, and sea tactical strike missions and is critical to the Navy's vision for the future of strike warfare. Fiscal Year 2016 funding is vital to maintain schedule, allowing the program to complete Technology Maturation and Risk Reduction (TMRR) and transition into the Engineering and Management Development (EMD) phase. Initial concept studies and formal program stand-up will begin in Fiscal Year 2016 for Increment 2.

Airborne Electronic Attack (AEA) / EA-6B Prowler

The Fiscal Year 2016 President's Budget request includes $15.5 million in RDT&E,N for Electronic Warfare (EW) Counter Response, $2.8 million RDT&E,N for MAGTF EW, $23.2 million in APN for Airborne Electronic Attack (AEA) systems, $9.8 million in APN for all EA-6B series aircraft, and $7.7 million APN for MAGTF EW.

Currently, there are 37 EA-6Bs in the Navy and Marine Corps, which are distributed to three Marine Corps and one Navy operational squadron, one Navy flight test squadron, and one Marine Corps training squadron. The total includes five Navy ICAP II aircraft and 32 ICAP III aircraft. All ICAP III EA-6Bs are operated by the Marine Corps. Final retirement of the EA-6B from the DoN inventory will be in 2019.

Marine aviation is on a path toward a distributed AEA 'system of systems' that is a critical element in achieving the MAGTF EW vision: A composite of manned and unmanned surface, air, and space assets on a fully collaborative network providing the MAGTF commander control of the electromagnetic spectrum when and where desired. Included in this plan are the ALQ-231 Intrepid Tiger II communications jammer, UAS EW payloads, a Software Reprogrammable Payload and an EW Services Architecture to facilitate collaborative networked EW Battle Management.

Intrepid Tiger II development and procurement is in response to Marine Corps requirements for increased precision EW capability and capacity across the MAGTF and provides EW capability directly to tactical commanders without reliance upon the limited availability of the low density/high demand EA-6B Prowler. Intrepid Tiger II is currently carried on AV-8B and F/A-18 A++/C/D aircraft, has successfully completed nine deployments, and is currently deployed with both the 11th and 24th MEUs. Integration on Marine Corps rotary-wing aircraft is scheduled to be completed by the fourth quarter of Fiscal Year 2015. Development of an Intrepid Tiger II counter-radar capability for the penetrating jammer mission will begin in Fiscal Year 2016.

E-2D Advanced Hawkeye (AHE)

The Fiscal Year 2016 President's Budget requests $272.1 million in RDT&E,N for continuation of added capabilities, to include In-Flight Air Refueling, Tactical Targeting Network Technology (TTNT), Secret Internet Protocol Router chat, Advanced Mid-Term Interoperability Improvement Program, Multifunctional Information Distribution System/Joint Tactical Radio System TTNT, Counter Electronic Attack, Sensor Netting, and Data Fusion. In the third year of a 26 aircraft Multi-Year Procurement (MYP) contract covering Fiscal Years 2014-2018, the budget requests $1,053 million in APN for five Full Rate Production (FRP) Lot 4 aircraft , Advance Procurement (AP) for Fiscal Year 2017 FRP Lot 5 aircraft; and Economic Ordering Quantity funding for the MYP for Fiscal Year 2018.

The E-2D AHE is the Navy's carrier-based Airborne Early Warning and Battle Management Command and Control system. The E-2D AHE provides Theater Air and Missile Defense and is capable of synthesizing information from multiple onboard and off-board sensors, making complex tactical decisions and then disseminating actionable information to Joint Forces in a distributed, open-architecture environment. E-2D is also a cornerstone of the Naval Integrated Fire Control – Counter Air (NIFCA-CA) capability.

Utilizing the newly developed AN/APY-9 Mechanical/Electronic Scan Array radar and the Cooperative Engagement Capability (CEC) system, the E-2D AHE works in concert with tactical aircraft and surface-combatants equipped with the Aegis combat system to detect, track and defeat air and cruise missile threats at extended ranges.
The first Fleet E-2D squadron (VAW-125) was designated "safe for flight" in January 2014. IOC was achieved in October 2014.

ASSAULT SUPPORT AIRCRAFT

MV-22

The Fiscal Year 2016 President's Budget requests $87.9 million in RDT&E,N for continued product improvements, including engineering development of a Navy variant of the MV-22; and $1.48 billion in APN for procurement and delivery of 19 MV-22s (Lot 20). Fiscal Year 2016 will be the fourth year of the 2nd V-22 MYP contract covering Fiscal Years 2013-2017. The funds requested in the Fiscal Year 2016 President's Budget fully fund Lot 20 and procure long-lead items for Fiscal Year 2017 Lot 21 MV-22 aircraft. The APN request includes $126.1 million to support Operations and Safety Improvement Programs (OSIPs), including Correction of Deficiencies and readiness improvements. The Fiscal Year 2016 request includes funding starting in Fiscal Year 2018 to procure a Navy variant in support of the Carrier Onboard Delivery mission.

MV-22 Osprey vertical flight capabilities, coupled with the speed, range, endurance of fixed-wing transports, are enabling effective execution of current missions that were previously unachievable. In 2014, a second Marine Corps SPMAGTF-CR was stood up in CENTCOM and the twelfth and final MV-22 for HMX-1 "Greenside" logistics and passenger transport was delivered for support of the Presidential transport mission. As the V-22 fleet approaches the 300,000 flight hour milestone it has proven to be the safest Marine Corps rotorcraft.

The second MYP, which began in Fiscal Year 2013, will procure at least 93 MV-22s over five years and results in savings of approximately $1 billion when compared to single year procurements. The stability of the MYP supports the Marine Corps' retirement of legacy aircraft, benefits the supplier base and facilitates cost reductions on the part of both the prime contractor and sub-tier suppliers.

Due to extremely high demand for MV-22 capability from the Combatant Commanders, and a resultant high operational tempo in 2014, the mission capability rates leveled-off

and did not continue the year over year improvements seen since 2010. This was primarily due to our inability to train enlisted maintainers in the numbers and qualifications standard we need to sustain such a high demand signal. Right now we have 13 Full Operational Capability squadrons, with two in build, and are executing to an overall 15 squadron demand signal. We are shifting resources and modifying standup, transition, and training plans, but the demand for the capabilities this aircraft brings to the COCOMs is creating growing pains. While we are confident these issues will be overcome, there has been an impact on our readiness rates. Despite a readiness rate decrement, the cost per flight hour has continued to decrease, with a total reduction of nearly 28 percent since 2010. Fiscal Year 2016 OSIP provides a necessary and stable source of crucial modification funding as the Ospreys work to improve readiness and continue to reduce operating cost.

Concurrent with our readiness and support initiatives, we are adding capabilities to the MV-22 that will make it even more valuable to the COCOMs. First, we are expanding the number of aerial refueling platforms that can refuel an MV-22, increasing the range of available options to capitalize on its long-range capabilities. We are also developing a mission kit to allow the MV-22 to deliver fuel to other airborne platforms. We see this as a critical enabler for both shore and sea-based operations. We plan to deliver this capability by the Summer of 2017 concurrent with the first Western Pacific deployment of the F-35B. We are also looking at options that will enable the delivery of precision-guided munitions from the MV-22, which will enhance its ability to operate autonomously and increase the lethality of our force. Finally, an important capability that is a priority for entire aviation force is Digital Interoperability (DI). We are testing and deploying the initial configuration of an onboard suite of electronics that will allow the embarked troop commander to possess unprecedented situational awareness via real time transmission of full motion video and other data generated by multiple air and ground platforms throughout the battlespace. This DI suite will also be able to collect, in real-time, threat data gathered by existing aircraft survivability equipment and off board data

to accompanying attack platforms, thereby shortening the kill chain against ground and air based threats.

In ongoing operations in the Middle East, the MV-22 has become the Tactical Recovery of Aircraft and Personnel (TRAP) platform of choice to rescue downed aircrew in hostile territory. Currently, Marines are on alert in Central Command to recover American and Coalition aircrew executing strike operations. The speed, range, and aerial refueling capability have allowed the Osprey's to remain in strategic locations throughout the area poised for rescue operations. With an unrefueled mission radius of 423 nautical miles, the Osprey can reach greater distances around the battlefield to increase the likelihood of recovering isolated personnel as the speed and altitude envelopes provide better survivability for the TRAP force and recovered aircrew.

CH-53K Heavy Lift Replacement Program

The Fiscal Year 2016 President's Budget requests $632.1 million RDT&E,N to continue the EMD phase of the CH-53K program. Since entering into developmental test in December 2013 the Ground Test Vehicle (GTV) has completed bare head light-off and shakedown light-off has commenced. Over the last year, the GTV has accumulated over 180 test hours. The first flight vehicle, Engineering Development Model (EDM) 1, has completed its bare head light-off and initial bladed ground runs. The program is currently on schedule to execute its first flight by the end of 2015. During Fiscal Year 2016, the program will continue to execute developmental test flights, deliver the final EDM, and continue assembly of System Demonstration Test Article aircraft, which will be production representative aircraft utilized for Operational Test.

The CH-53K will provide land and sea based heavy-lift capabilities not resident in any of today's platforms and contribute directly to the increased agility, lethality, and presence of joint task forces and MAGTFs. The CH-53K will transport 27,000 pounds of external cargo out to a range of 110 nautical miles, nearly tripling the CH-53E's lift capability

under similar environmental conditions, while fitting into the same shipboard footprint. The CH-53K will also provide unparalleled lift capability under high-altitude and hot weather conditions, greatly expanding the commander's operational reach.

Compared to the CH-53E, maintenance and reliability enhancements of the CH-53K will improve aircraft availability and ensure cost effective operations. Additionally, survivability and force protection enhancements will dramatically increase protection for both aircrew and passengers. Expeditionary heavy-lift capabilities will continue to be critical to successful land and sea-based operations in future anti-access, area-denial environments, enabling sea-basing and the joint operating concepts of force application and focused logistics.

Over the past 13 years, the CH-53 community accumulated over 95,000 combat flight hours. During this period, we suffered ten aircraft losses, nine in combat and one in training. As our CH-53E community approaches 30-years of service, these sustained and unprecedented operational demands have prematurely aged our heavy lift assault support aircraft, making it ever more challenging to maintain and underscoring the importance of its replacement, the CH-53K King Stallion. To keep the H-53E viable until the King Stallion enters service, the Fiscal Year 2016 President's Budget requests $46.9 million in APN for both near and mid-term enhancements. For both the USN MH-53E and USMC CH-53E helicopters these modifications include Condition Based Maintenance software upgrades, Kapton wiring replacement installations, and improved Engine Nacelles. The Fiscal Year 2016 budget request includes non-recurring engineering for upgrades to the MH-53E's antiquated cockpit. These critical safety and avionics upgrades will address obsolescence issues within the cockpit and increase overall situational awareness and mission effectiveness by improving minefield navigation displays, adding Area Navigation (RNAV) capability, and providing moving map and hover displays. Additionally, non-recurring engineering and kit procurements for the Embedded Global Positioning System/Inertial Navigation System (EGI) will allow the MH-53E to utilize

the full capability of the APX-123 transponder. The Marine Corps' CH-53E fleet is continuing with the T-64 Engine Reliability Improvement Program, Critical Survivability Upgrade (CSU), Satellite Communications (SATCOM) kit installations, and Smart Multi-Function Color Display (SMFCD) procurements and installations.

ATTACK AND UTILITY AIRCRAFT

UH-1Y // AH-1Z

Marine Corps Cobra and Huey attack and utility aircraft have been critical for the success of the Marines in harm's way and over the past 10 years, these aircraft have flown over 196,000 hours in combat. The Fiscal Year 2016 President's Budget requests $27.2 million in RDT&E,N for continued product improvements; and $856.2 million in APN for 28 H-1 upgrade aircraft: 12 UH-1Y and 16 AH-1Z. The program is a key modernization effort designed to resolve existing safety deficiencies and enhance operational effectiveness of the H-1 fleet. The 85 percent commonality between the UH-1Y and AH-1Z will significantly reduce life-cycle costs and the logistical footprint, while increasing the maintainability and deployability of both aircraft. The program will provide the Marine Corps with 349 H-1 aircraft through a combination of new production and a limited quantity of remanufactured aircraft.

The H-1 Upgrades Program is replacing the Marine Corps' UH-1N and AH-1W helicopters with state-of-the-art UH-1Y "Yankee" and AH-1Z "Zulu" aircraft. The new aircraft are fielded with integrated glass cockpits, world-class sensors, and advanced helmet-mounted sight and display systems. The future growth plan includes a digitally-aided, close air support system designed to integrate these airframes, sensors, and weapons systems together with ground combat forces and other capable DoD aircraft. Integration of low-cost weapons such as the Advanced Precision Kill Weapon System II provides increased lethality while reducing collateral damage.

The UH-1Y aircraft achieved IOC in August 2008 and FRP in September 2008. The "Yankee Forward" procurement strategy prioritized UH-1Y production in order to replace the under-powered UH-1N fleet as quickly as possible. The last UH-1N was retired from service as of December 2014. The AH-1Z program received approval for FRP in November 2010 and achieved IOC in February 2011. As of February 2015, 148 aircraft (109 UH-1Ys and 39 AH-1Zs) have been delivered to the Fleet Marine Force. An additional 60 aircraft are on contract and in production. Lot 1-7 aircraft deliveries are complete for both the UH-1Y and AH-1Z. Lot 8 and 9 deliveries are complete for the UH-1Y, and Lot 10 UH-1Y deliveries are in progress and ahead of schedule.

The H-1 program is in the process of integrating both the UH-1Y and AH-1Z into the larger digitally interoperable programs of the Marine Corps. With the integration of Intrepid Tiger II, the HMLA community will now be able to provide the MAGTF Commanders with all six essential functions of Marine Air. Additionally, these aircraft will incorporate Software Reprogrammable Payload (SRP) to utilize diverse networks and waveforms thus allowing maneuverability within the spectrum. SRP will employ systems as Link-16, Tactical Targeting Network Technology, Adaptive Networking Wideband Waveform, and the Soldier Radio Waveform.

MH-60 (Overview)

MH-60 Seahawks have consistently met readiness and operational commitments. There will be 38 Navy Seahawk squadrons with 275 MH-60S and 280 MH-60R aircraft when transitions from the SH-60B, SH-60F, and HH-60H are complete. Production and squadron transitions will continue through 2017. Over the last twelve years of combat operations, deployed ashore and aboard our aircraft carriers, amphibious ships, and surface combatants at sea, Navy H-60 helicopters have provided vital over-watch and direct support to troops in combat across multiple theaters of operation and variety of missions; including support to special operations forces, air ambulance, surface warfare,

anti-submarine warfare, mine warfare, logistics support and humanitarian assistance/disaster relief.

MH-60R Seahawk

The Fiscal Year 2016 President's Budget requests $970 million in APN for 29 helicopters. The production program continues to deliver on-cost and on-schedule.

The MH-60R Multi-Mission Helicopter provides strike group protection and adds significant capability in its primary mission areas of Undersea Warfare and Surface Warfare; the latter including Fast Attack Craft/Fast In-shore Attack Craft (FAC/FIAC) threat response capabilities. The MH-60R is the sole organic air Anti-Submarine Warfare (ASW) asset in the Carrier Strike group (CSG) and serves as a key contributor to theater level ASW. The MH-60R also employs advanced sensors and communications to provide real-time battlespace management with a significant, active or passive, over-the-horizon targeting capability. Secondary mission areas include Search and Rescue, Vertical Replenishment, Naval Surface Fire Support, Logistics Support, Personnel Transport and Medical Evacuation.

The $21.4 million RDT&E,N request supports the MH-60R Test Program, consisting of numerous system upgrades and Pre-Planned Product Improvements, to include the Digital Rocket Launcher (DRL) with APKWS II, Helicopter Infra-Red Suppression System, Multifunctional Information Distribution System - Low Volume Terminal (LVT) Block Upgrade 2, and the VHF Omnidirectional Ranging/Instrument Landing System.

MH-60S Seahawk

The Fiscal Year 2016 President's Budget requests $28 million in APN for annualized support of the final deliveries of aircraft, trainers, ground support equipment, and publications required to complete the production program of 275 helicopters. The production program continues to deliver on-cost and on-schedule. The MH-60S Multi-

Mission Helicopter provides strike group protection and adds significant capability in its primary mission areas of Mine Warfare and Surface Warfare. Secondary mission areas include Combat Search and Rescue, Support to Special Operations Forces, Vertical Replenishment, Logistics Support, Personnel Transport and Medical Evacuation.

The $5.2 million RDT&E,N request supports the MH-60S Test Program, consisting of system upgrades for Airborne Mine Countermeasures (AMCM), Armed Helicopter FAC/FIAC Defense, and the commencement of a service life assessment program.

Armed Helo Block 3A Operational Test (OT) was completed in June 2007 and Block 3B (added Link 16 capability) OT was completed in November 2009. Test and Evaluation (T&E) of fixed forward firing weapon (FFW) (20mm gun system) was completed in Fiscal Year 2012. T&E of initial FFW Unguided Rocket (UGR) capability was completed in Fiscal Year 2013. T&E for Digital Rocket Launcher APKWS II and expanded UGR capability for the FAC/FIAC threat is in work and planned to complete in Fiscal Year 2016. Planned Airborne MCM Initial Operational Test and Evaluation (IOT&E) and Follow-On Operational Test and Evaluation (FOT&E) periods were changed to Operational Assessments, with the final IOT&E aligned with LCS Mine Counter Measures Mission Package IOT&E.

EXECUTIVE SUPPORT AIRCRAFT

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

The VH-3D and VH-60N are safely performing the Executive Lift mission worldwide. As these aircraft continue to provide seamless vertical lift for the President of the United States, the DoN is working closely with HMX-1 and industry to sustain these aircraft until a Presidential Helicopter Replacement platform is fielded. The Fiscal Year 2016 President's Budget requests an investment of $76.1 million of APN to continue programs that will ensure the in-service Presidential fleet remains a safe and reliable platform.

Ongoing VH-60N efforts include the Cockpit Upgrade Program, engine upgrade program, and a Communications Suite Upgrade (Wide Band Line of Sight) that provides survivable access to the strategic communications network. The continuing Structural Enhancement Program and the Obsolescence Management Program applies to both VH-60N and VH-3D. The program has significantly reduced the cost and schedule of the VH-3D Cockpit Upgrade Program by focusing on critical obsolescence issues. These technology updates for legacy platforms will be directly leveraged for the benefit of the ensuing replacement program (VH-92A).

VH-92A Presidential Helicopter Replacement Aircraft

The Fiscal Year 2016 President's Budget request includes $507.1 million of RDT&E,N to fund the VH-92 EMD contract and associated government activities. Significant progress has been made in the past year with completion of the Milestone B Review in March, receipt of the Acquisition Decision Memorandum in April, award of the EMD contract to Sikorsky Aircraft Corporation in May, completion of the System Requirements Review in August and completion of the Integrated Baseline Review in November. The Sikorsky S-92A aircraft will be used to execute the acquisition strategy of integrating mature subsystems into an air vehicle that is currently in production. Initial contractor testing on an S-92A aircraft is planned for 2015 and early 2016, and the critical Design Review is planned for the 4th quarter of Fiscal Year 2016. The first of the planned operational inventory of 21 aircraft could begin fielding as early as 2020.

FIXED-WING AIRCRAFT

KC-130J

The DoN plans to procure two KC-130Js and continue product improvements. Targeted improvements include aircraft survivability through advanced electronic countermeasure modernization and obsolescence upgrades to the Harvest HAWK ISR/Weapon Mission Kit.

Fielded throughout our active force, the KC-130J brings increased capability, performance and survivability with lower operating and sustainment costs to the MAGTF. Forward deployed in support of ongoing operations since 2005, the KC-130J continues to deliver Marines, fuel and cargo whenever and wherever needed. In 2015 the KC-130J remains in high demand, providing tactical air-to-air refueling, assault support, Close Air Support (CAS) and Multi-sensor Imagery Reconnaissance (MIR) capabilities, in support of Special Purpose MAGTFs and deployed MEUs.

First deployed in 2010, the roll-on/roll-off Harvest HAWK mission kit for the KC-130J continues to provide extended MIR and CAS capabilities. With almost 7,000 hours flown, over 200 Hellfire missile and 90 Griffin munition combat engagements, this expeditionary mission kit has proven its worth and made the KC-130J even more indispensable for Marines on the ground. All six mission kits have been fielded, and funding included in the FY 2016 budget request will be used to maintain operational relevance of this mission system through compatibility with additional Hellfire variants and an improved full motion video data-link.

The Marine Corps has funded 53 of the 79 KC-130J aircraft in the program of record. The three aircraft included in the Fiscal Year 2013 budget would complete the Active Component (AC) requirement of 51 aircraft. However, the Marine Corps began using the AC backup aircraft to accelerate the Reserve Component (RC) transition from the legacy KC-130T aircraft to the more capable and efficient KC-130J in FY 2014. The aircraft requested in the FY 2016 President's Budget will continue to increase KC-130J inventory as we strive to achieve Full Operational Capability in the RC. Delays in procurement would force the Marine Corps to sustain the KC-130T aircraft longer than planned at an increased cost.

It is also important to note that the US Air Force C-130J procurement is expected to end in 2022. If the Marine Corps procures KC-130Js at a rate of two per year from Fiscal Year 2016-2022, we will have approximately 12 aircraft remaining to procure in order to reach the Program of Record (POR) of 79 aircraft. This POR is expected to complete in 2029. After the USAF completes its C-130J procurement, NAVAIR will no longer be able to leverage USAF contracting services. Given the loss of USAF contracting services and the uncertainty of additional Foreign Military Sales, the Navy and Coast Guard customers potentially could have a significant unit cost increase.

MARITIME SUPPORT AIRCRAFT

P-8A Poseidon

The P-8A Poseidon recapitalizes the Maritime Patrol ASW, Anti-Surface Warfare (ASuW) and armed ISR capability currently resident in the P-3C Orion. The P-8A combines the proven reliability of the commercial 737 airframe with avionics that enables integration of modern sensors and robust communications. The P-8A's first operational deployment was completed in June 2014, and continuous 7th Fleet operational deployments are underway. As of February 2015, four Fleet squadrons have completed transition to P-8A. All Fleet squadrons are scheduled to complete transition by the end of FY 2019. The P-8A program is meeting all cost, schedule and performance parameters in accordance with the approved Acquisition Program Baseline.

Boeing has delivered 21 aircraft (Low Rate Initial Production (LRIP) I/II/III) to the Fleet as of February 2015, and three remaining LRIP III aircraft are scheduled to deliver by May 2015. LRIP IV (13 aircraft), and FRP 1 (16 aircraft) are under contract and will start delivering in May 2015. FRP 2 (nine aircraft) is planned to award in June 2015. The FY 2016 President's budget procures 47 P-8As over the FYDP and sustains the P-3C to P-8A transition. In Fiscal Year 2016 the warfighting requirement remains 117 aircraft;

however, the fiscally constrained inventory objective for 109 aircraft will provide adequate capacity at acceptable levels of risk.

As fleet deliveries of the Increment 1 configuration accelerate, integration and testing of P-8A Increment 2 capability upgrades continues. P-8A Increment 2 Engineering Change Proposal (ECP) 1 "Early Multi-Static Active Coherent (MAC)" FOT&E commenced November 15, 2014. The Navy is on track to field the ECP 1 "Early MAC" capability in Fiscal Year 2015 followed by Increment 2 ECP 2 "Full MAC" capabilities in Fiscal Year 2016. The Increment 2 ECP 3 contract for High Altitude ASW Weapons Capability capabilities was awarded in December 2014.

P-3C Orion

The aging P-3 fleet will continue to provide critical ASW, ASuW and ISR support for joint and naval operations worldwide until the Fleet completes transition to P-8A. The Fiscal Year 2016 budget request provides $3.1 million in funding required to manage P-3C aircraft mission systems obsolescence during the transition. As of December 2014, 61 P-3 Special Structural Inspection-Kits have been installed (zero remaining); 87 Zone 5 modifications completed (last three aircraft in work); and 20 Outer Wing Installations completed (last nine aircraft in work).

The P-3 aircraft is well beyond the original planned fatigue life of 7,500 hours for critical components, with an average airframe usage of over 18,400 hours. The Fiscal Year 2016 request continues to fund the P-3 Fatigue Life Management Program so the Navy can maintain sufficient capacity to successfully complete the transition to P-8A.

EP-3 Aries Replacement/Sustainment

The EP-3E Aries is the Navy's premier manned Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) platform. The Joint Airborne Signals intelligence (SIGINT) Common Configuration includes Multi-Intelligence sensors, robust

communication, and data links employed by the flexible and dependable P-3 air vehicle to ensure effective MISR&T support across the full Range of Military Operations. The Fiscal Year 2011 National Defense Authorization Act directed Navy to sustain EP-3E airframe and mission systems relevance to minimize SIGINT capability gaps until the systems are fully recapitalized with a platform or family of platforms that in the aggregate provide equal or better capability and capacity. The Fiscal Year 2016 request maintains the retirement dates from the previous year that were extended by one year to Fiscal Year 2019 and Fiscal Year 2020, respectively.

Navy ISR family of systems approach shifts focus from platforms to payloads. The future force will rapidly respond to changing threats with modular, scalable, netted sensors and payloads on a range of sea and shore-based manned and unmanned systems, establishing persistent Maritime ISR when and where it is needed.

Navy's ISR&T transition plan will deliver increased capacity and persistence by the end of the decade. However, due to fiscal and end strength constraints, the Department will accept some risk in near term capability and capacity. The Fiscal Year 2016 budget request reduces risk compared to the previous fiscal year and the Navy continues to work with Joint Staff, DoD, and the Fleet to optimize the ISR transition plan. The transition plan remains largely unchanged from Fiscal Year 2015.

AIRLIFT/CARGO UTILITY AIRCRAFT

COD Recapitalization (Navy V-22 Variant)

The C-2A fleet, which provides long-range logistical support to carrier strike groups, will reach the end of its service life in the mid-2020s with continued sustainment investment. The Navy is planning to recapitalize the COD capability with an extended range variant of the V-22. Fiscal Year 2016 investments support an affordable COD recapitalization

plan that procures a version of the V-22 Osprey under the existing Program of Record (POR).

The Navy's variant of V-22 has been a component of the POR since program inception. This transition strategy allows the Navy to recapitalize the aging C-2 COD capability in an affordable manner and evolve the Aerial Logistics Concept of Operations from the CVN centric "Hub and Spoke" model to a flexible Sea Base support concept.

UNMANNED AIRCRAFT SYSTEMS (UAS)

MQ-4C Triton UAS

The Fiscal Year 2016 President's Budget enables MQ-4C Triton entry into production with three LRIP aircraft in Fiscal Year 2016.

The Fiscal Year 2016 President's Budget requests $227.2 million in RDT&E,N to continue Triton development activities, $150.9 million in RDT&E for Triton modernization, and $548.8 million of APN for procurement of the first lot of LRIP aircraft and for procurement of long lead materials for the second lot of LRIP aircraft.

Triton will start establishing five globally-distributed, persistent maritime ISR orbits beginning in Fiscal Year 2018, as part of the Navy's Maritime ISR&T transition plan. MQ-4C Triton test vehicles have completed 21 total flights as of February 2015 and are on schedule to begin sensor integration testing this spring. This rigorous integrated flight test program will support Milestone C planned for Fiscal Year 2016. The MQ-4C Triton is a key component of the Navy Maritime Patrol Reconnaissance Force. Its persistent sensor dwell, combined with networked sensors, will enable it to effectively meet ISR requirements in support of the Navy Maritime Strategy.

The Navy currently maintains an inventory of four USAF Global Hawk Block 10 UAS, as part of the BAMS Demonstrators, or BAMS-D program. These aircraft have been

deployed to CENTCOM's AOR for over six years. BAMS-D recently achieved over 14,000 flight hours in support of CENTCOM ISR tasking. These assets are adequate to cover all Navy needs through Fiscal Year 2018.

Unmanned Combat Air System Demonstration (UCAS-D)

The Fiscal Year 2016 President's Budget requests no funding for the UCAS-D program. The UCAS-D program is in its final year of funding ($35.9M in RDT&E,N for Fiscal Year 2015). With the completion of the Autonomous Aerial Refueling test flights this spring, the demonstration will come to a successful close. The X-47B has met demonstration objectives and reduced technical risk by transferring lessons learned to the UCLASS program. The X-47B demonstrators have paved the way for the proficient introduction of a sea-based unmanned aircraft system by digitizing the carrier controlled environment, achieving precision landing navigation performance, demonstrating a deck handling solution, and refining the concept of operations.

Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) System

The UCLASS system will provide the Carrier Strike Group (CSG) with a persistent unmanned ISR&T and precision strike capability that is available organically to the CSG and comprehensively to the Joint force. The CSG is often the first responder for the nation. The UCLASS system will enhance the CSG's capability and versatility and enable sustained 24/7 operations from a single aircraft carrier. The Fiscal Year 2016 President's Budget requests $134.7 million in RDT&E,N for UCLASS system development efforts. This funding will continue progress on the Control System & Connectivity, Carrier Segments and the government Lead System Integrator efforts, while the Department conducts a Strategic Portfolio Review of ISR&T systems and the future composition of the carrier air wing.

The UCLASS system will be integrated with carrier air wing operations, increasing the effectiveness of current CSG ISR&T capabilities (airborne, surface, and sub-surface) beginning in the Fiscal Year 2022 timeframe. Once deployed, the UCLASS System will inherently provide reach-back to Navy and National architectures for command and control and for tasking, processing, exploitation, and dissemination. The UCLASS system will achieve these capabilities through the development and integration of a carrier-suitable, semi-autonomous, unmanned Air System; a Control System and Connectivity Segment; and NIMITZ/FORD class Carriers. The development and integration effort is overseen by the Government as the Lead Systems Integrator, providing system-of-systems integration for the UCLASS Program.

MQ-8 Vertical Takeoff and Landing Unmanned Aerial Vehicle (VTUAV) Fire Scout

The MQ-8 Fire Scout is an autonomous system designed to operate from any suitably-equipped air-capable ship, carry modular mission payloads, and operate using the Tactical Control System and Line-Of-Sight Tactical Common Data Link. The Fiscal Year 2016 President's Budget requests $52.8 million of RDT&E,N to continue development of the MQ-8C endurance upgrade, to include integration of ISR payloads, radar and short range air to surface weapons. Funding will also be used to continue payload and Frigate integration with the MQ-8B and MQ-8C. The request for $142.5 million in APN procures MQ-8C air vehicles; MQ-8 System mission control systems; ancillary, trainers and support equipment; technical support; modifications based on engineering changes; and logistics products and support to outfit suitably-equipped air-capable ships and train the associated Aviation Detachments. Commonality of avionics, software, and payloads between the MQ-8B and MQ-8C has been maximized. The MQ-8B and MQ-8C air vehicles will utilize the same ship-based mission control system and other ship ancillary equipment.

Fire Scout was deployed to Afghanistan from May 2011 until August 2013, and amassed more than 5,100 dedicated ISR flight hours in support of U.S. and coalition forces. Since

2012, the MQ-8B Fire Scout has flown more than 7,500 hours from Navy Frigates, performing hundreds of autonomous ship board take-offs and landings in support of Special Operations Forces and Navy operations. The MQ-8C Fire Scout continues developmental test and has completed phase II dynamic interface testing aboard the Navy destroyer USS JASON DUNHAM. The MQ-8C has flown more than 400 flight hours since October of 2013. The Fire Scout program will continue to support integration and testing for LCS-based mission modules.

Tactical Control System (TCS)

The Fiscal Year 2016 President's Budget requested $8.6 million in RDT&E,N for the MQ-8 System's Tactical Control System (TCS). TCS provides a standards-compliant open architecture with scalable command and control capabilities for the MQ-8 Fire Scout system. In Fiscal Year 2016 TCS will continue to transition the Linux operating system to a technology refreshed mission control system, and enhance the MQ-8 System's Automatic Identification System and sensor track generation integration with ship systems. The Linux operating system conversion overcomes hardware obsolescence issues with the Solaris based control stations and provides lower cost software updates using DoD common application software. In addition, the TCS Linux upgrade will enhance collaboration with the Navy's future UAS Common Control System.

Small Tactical Unmanned Aircraft System (STUAS) RQ-21A Blackjack

The Fiscal Year 2016 President's Budget requests $11.1 million in RDT&E ($4.7 million USN, $6.4 million USMC); $55.0 million in APN for three Navy systems to support Naval Special Warfare; and $84.9 million in PMC for four RQ-21A systems (which includes 20 air vehicles) to address Marine Corps ISR capability requirements currently supported by service contracts. This Group 3 UAS will provide persistent ship and land-based ISR support for expeditionary tactical-level maneuver decisions and unit level force defense and force protection missions. Blackjack entered LRIP in 2013, completed

IOT&E in the second quarter of Fiscal Year 2015, with Full Rate Production planned for the first quarter of Fiscal Year 2016.

The RQ-21's current configuration includes full motion video, communications relay package and automatic identification systems. The air vehicle's payload bay allows for rapid deployment of signal intelligence payloads. The Marine Corps is actively pursuing technological developments for the RQ-21 system in an effort to provide the MAGTF and Marine Corps Forces Special Operations Command with significantly improved capabilities. Initiatives include over-the-horizon communication and data relay ability to integrate the system into future networked digital environments; electronic warfare and cyber payloads to increase non-kinetic capabilities; and change detection radar and moving target indicators to assist warfighters in battlespace awareness and force application.

RQ-7B Shadow Marine Corps Tactical UAS (MCTUAS)

The Fiscal Year 2016 President's Budget requests $0.7 million in RDT&E,N for the RQ-7B Shadow to continue joint development efforts and government engineering support and $3.8 million in APN to acquire PRC-152A radios and weatherization kits.

STRIKE WEAPONS PROGRAMS

Tactical Tomahawk (TACTOM) BLK IV Cruise Missile Program

The Fiscal Year 2016 President's Budget requests $184.8 million in WPN for procurement of an additional 100 TACTOM weapons and associated support, $28.0 million in OPN for the Tomahawk support equipment, and $17.7 million in RDT&E,N for capability updates of the weapon system. WPN resources will be for the continued procurement of this versatile, combat-proven, deep-strike weapon system in order to meet ship load-outs and combat requirements. OPN resources will address the resolution of Tactical Tomahawk Weapons Control Station obsolescence, interoperability, and

information assurance mandates. RDT&E,N will be used to continue engineering efforts for A2/AD navigation and communication upgrades.

Tomahawk provides an attack capability against fixed and mobile/moving targets, and can be launched from both Surface Ships and Submarines. The current variant, TACTOM, preserves Tomahawk's long-range precision-strike capability while significantly increasing responsiveness and flexibility. TACTOM's improvements include in-flight retargeting, the ability to loiter over the battlefield, in-flight missile health and status monitoring, and battle damage indication imagery, providing a digital look-down "snapshot" of the battlefield via a satellite data link. Other Tomahawk improvements include rapid mission planning and execution via Global Positioning System (GPS) onboard the launch platform and improved anti-jam GPS.

Tomahawk Theater Mission Planning Center (TMPC)

The Fiscal Year 2016 President's Budget for TMPC requests $7.5 million in RDT&E,N and $43.2 million OPN for continued system upgrades and sustainment. TMPC is the mission planning and strike execution segment of the Tomahawk Weapon System. TMPC develops and distributes strike missions for the Tomahawk Missile; provides for precision targeting, weaponeering, mission and strike planning, execution, coordination, control and reporting. TMPC provides Combatant Commanders and Maritime Component Commanders the capability to plan and/or modify conventional Tomahawk Land-Attack Missile missions. TMPC optimizes all aspects of the Tomahawk missile technology to successfully engage a target. TMPC is a Mission Assurance Category 1 system, vital to operational readiness and mission effectiveness of deployed and contingency forces. Planned upgrades support integration, modernization and interoperability efforts necessary to keep pace with missile upgrades. These required upgrades keep pace with new imagery formats, threat changes, improved GPS denied navigation capability, mission planning timeline improvements, upgraded communications architecture. Additionally, Cyber security mandates will be

implemented to reduce TMPC vulnerability to cyber-attacks. These upgrades are critical for the support of over 180 TMPC operational sites worldwide, afloat and ashore, to include: Cruise Missile Support Activities (inclusive of US STRATCOM), Tomahawk Strike and Mission Planning Cells (5th, 6th, 7th Fleet), Carrier Strike Groups, Surface and Subsurface Firing Units and Labs/Training Classrooms.

Offensive Anti-Surface Warfare (OASuW)/Increment 1 Weapon

The Fiscal Year 2016 President's Budget requests $285.8 million in RDT&E,N for the completion of technology maturation and initiation of integration and test of the air-launched OASuW/Increment 1 program. Increment 1 leverages the Defense Advanced Research Projects Agency Long Range Anti-Ship Missile (LRASM) weapon demonstration effort. Increment 1 provides Combatant Commanders the ability to conduct ASuW operations against high value surface combatants protected by Integrated Air Defense System with long- range Surface-to-Air-Missiles and denies the adversary the sanctuary of maneuver. The OASuW/Increment 1 program is a DoN led joint program, scheduled to field on the B-1 by the end of Fiscal Year 2018 and the F/A-18E/F by the end of Fiscal Year 2019.

Next Generation Strike Capability (NGSC)

The Fiscal Year 2016 budget requests $9.6 million for initiation of efforts to develop a Next Generation Strike Capability (NGSC). As part of a long-term strike weapons strategy, NGSC will study long-range, survivable, multi-mission, multi-platform conventional strike capability options planned to IOC in the mid-2020 timeframe. NGSC will become the follow-on acquisition program to the current OASuW/Increment I (LRASM) and Tomahawk Weapon System modernization programs. The NGSC program will commence an Analysis of Alternatives (AoA) during Fiscal Year 2016. The AoA will assess existing weapons systems, emergent technologies, and industry internal research and development activities; develop potential program of record costs, schedules, and risk assessments; and conduct additional threat assessments based on

projected scenarios and operational environments. This analytical data will inform performance and relevant technology requirements to be matured as part of potential NGSC materiel solution(s) and associated kill-chain(s).

Sidewinder Air-Intercept Missile (AIM-9X)

The Fiscal Year 2016 President's Budget requests $76.0 million in RDT&E,N and $96.4 million in WPN for this joint DoN and USAF program. RDT&E,N will be applied toward the Engineering Manufacturing Development phase of critical hardware obsolescence redesign, Development Test of missile v9.4 software, and the design and development of Joint Chiefs of Staff directed Insensitive Munitions improvements. WPN funding is requested for production of a combined 227 All-Up-Rounds and Captive Air Training Missiles and missile-related hardware. The AIM-9X Block II Sidewinder missile is the newest in the Sidewinder family and is the only short-range infrared air-to-air missile integrated on Navy, Marine Corps, and USAF strike-fighter aircraft and Marine Corps attack helicopters. This fifth-generation weapon incorporates high off-boresight acquisition capability and increased seeker sensitivity through an imaging infrared focal plane array seeker with advanced guidance processing for improved target acquisition; data link capability; and advanced thrust vectoring capability to achieve superior maneuverability and increase the probability of intercept of adversary aircraft.

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

The Fiscal Year 2016 President's Budget requests $32.2 million in RDT&E,N for continued software capability enhancements and $192.9 million in WPN production of a combined 167 All-Up-Rounds and Captive Air Training Missiles and missile-related hardware. AMRAAM is a joint USAF and DoN weapon that counters existing aircraft and cruise-missile threats. It uses advanced counter-electronic attack capabilities at both high and low altitudes, and can engage from beyond visual range as well as within visual range. AMRAAM provides an air-to-air first look, first shot, first kill capability, while working within a networked environment in support of the Navy's Theater Air and

Missile Defense Mission Area. RDT&E,N will be applied toward Software upgrades to counter emerging Electronic Attack threats for AIM-120C/D missiles.

Small Diameter Bomb II (SDB II)

The Fiscal Year 2016 President's Budget requests $97.0 million in RDT&E for continued development of the Department of the Air Force led joint service SDB II weapon and bomb-rack program. SDB II provides an adverse weather, day or night standoff capability against mobile, moving, and fixed targets, and enables target prosecution while minimizing collateral damage. SDB II will be integrated into the internal carriage of both DoN variants of the Joint Strike Fighter (F-35B and F-35C) as well as the Navy's F/A-18E/F. The Joint Miniature Munitions Bomb Rack Unit (JMM BRU) BRU-61A/A is being developed to meet the operational and environmental integration requirements for internal bay carriage of the SDB II in the F-35B and F-35C, and external carriage on F/A-18 E/F. JMM BRU entered Technology Development in June 2013.

Joint Standoff Weapon (JSOW)

The Fiscal Year 2016 President's Budget requests $0.4 million in RDT&E,N to address software integration and interoperability following the completion of efforts associated with Operational Testing in Fiscal Year 2015, and $21.4 million in WPN to begin Captive Air Training Missile (CATM) software integration, continuation of Telemetry Instrumentation Kit (TIK) Non Recurring Engineering and re-life efforts, and shutdown of the JSOW production line. The Department's decision to terminate JSOW C-1 production was due to fiscal constraints, an analysis of targets determining there was sufficient inventory to handle current operational needs, and the ongoing focus to fund future capabilities. The DoN has submitted a final 2014 termination Selected Acquisition Report and Congressional notification. The Navy is preparing a transition plan to address the production termination decision and document the planned use of RDT&E,N, WPN, and O&M,N resources to complete JSOW C-1 Operational Test activities, missile and TIK production, CATM conversions, and long-term weapon system operation & support.

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

The Fiscal Year 2016 President's Budget requests $12.9 million of RDT&E,N for Block 1 follow-on development and test program, $38.4 million of RDT&E,N for AARGM Extended Range (ER) development, and $122.3 million of WPN for production of 138 All-Up-Rounds and Captive Training Missiles. The AARGM cooperative program with the Italian Air Force transforms the High-Speed Anti-Radiation Missile (HARM) into an affordable, lethal, and flexible time-sensitive strike weapon system for conducting Destruction of Enemy Air Defense missions. AARGM adds multi-spectral targeting capability and targeting geospecificity to its supersonic fly-out to destroy sophisticated enemy air defenses and expand upon the HARM target set. The program achieved IOC on the F/A-18C/D aircraft in July 2012, with forward deployment to U.S. Pacific Command, and integration is complete for AARGM with release of H-8 System Configuration Set for F/A-18E/F and EA-18G aircraft. The development of an AARGM-ER modification program, involving hardware and software improvements, will begin in Fiscal Year 2016. This effort will increase the weapon system's survivability against complex, new, and emerging threat systems and enable launch platforms greater stand-off range.

Joint Air-to-Ground Missile (JAGM)

The Fiscal Year 2016 President's Budget requests $25.9 million in RDT&E,N to begin a five year integration effort of JAGM Increment 1 onto the Marine Corps AH-1Z in support of an Initial Operational Capability by Fiscal Year 2019. JAGM is a Department of the Army led, joint pre-Major Defense Acquisition Program. JAGM is a direct attack/close-air-support missile program that will utilize advanced seeker technology and be employed against land and maritime stationary and moving targets in adverse weather and will replace the Hellfire and TOW II missile systems. In November 2012, the Joint Chiefs of Staff authorized the JAGM incremental requirements and revalidated the

DoN's AH-1Z Cobra aircraft as a threshold platform. JAGM Increment 1 is expected to achieve Milestone B certification in Fiscal Year 2015.

Advanced Precision Kill Weapon System II (APKWS II)

The Fiscal Year 2016 President's Budget requests $53.5 million in PANMC for procurement of 1,834 APKWS II Precision Guidance Kits. APKWS II provides an unprecedented precision guidance capability to DoN unguided rocket inventories, improving accuracy and minimizing collateral damage. Program production continues on schedule, meeting the needs of our warfighters in today's theaters of operations. IOC was reached in March 2012 on the Marine Corps' AH-1W and UH-1Y.These platforms have expended more than 170 APKWS II weapons in combat. Marine Crops AH-1Z platforms will be certified to fire APKWS II in Fiscal Year 2015. The Navy successfully integrated APKWS II on the MH-60S for an Early Operational Capability in March 2014 and is on track to finalize a similar effort for the MH-60R in March 2015.

CONCLUSION

We are an agile strike and amphibious power projection force in readiness, and such agility requires that the aviation arm of our naval strike and expeditionary forces remain strong. Mr. Chairman, and distinguished committee members, we request your continued support for the Department's Fiscal Year 2016 budget request for our Naval Aviation programs.

United States Navy
Biography

Vice Admiral Paul A. Grosklags
Principal Military Deputy
Assistant Secretary of the Navy for Research, Development, and Acquisitions



Vice Adm. Grosklags is a native of DeKalb, Ill. After being designated a naval aviator in October 1983, he immediately reported to Training Squadron Three at North Whiting Field in Milton, Fla., as a T-34C flight instructor.

Grosklags served operational tours with Helicopter Antisubmarine Squadrons 34 and 42, where he flew the SH-2F and SH-60B, respectively. Grosklags made multiple deployments with the USS John Hancock (DD 981), USS Donald B. Beary (FF 1085), USS Comte de Grasse (DD 974), and USS Leyte Gulf (CG 55). He later served as both executive and commanding officer of Helicopter Training Squadron Eighteen 18.

Grosklags' acquisition tours include engineering test pilot and assignments as MH-60R assistant program manager for systems engineering, H-60 assistant program manager for test and evaluation, MH-60R deputy program manager, and ultimately as program manager for Multi-Mission Helicopters (PMA-299), during which time the MH-60R was successfully introduced to the fleet. Grosklags also served as operations officer and subsequently as deputy Program Executive Officer for Air Anti-Submarine Warfare, Assault and Special Mission Programs (PEO(A)).

Grosklags has served flag tours as commander, Fleet Readiness Centers and Naval Air Systems Command (NAVAIR) assistant commander for Logistics and Industrial Operation, NAVAIR vice commander, and PEO(A). In July 2013, he assumed responsibilities as principal military deputy for the Assistant Secretary of the Navy (Research, Development & Acquisition).

Grosklags graduated from the U.S. Naval Academy in 1982, is a graduate of the U.S. Naval Test Pilot School Class 99, and holds a Master of Science degree in Aeronautical Engineering from the Naval Postgraduate School. He has more than 5,000 military flight hours in numerous types of rotary and fixed-wing aircraft. Grosklags is a proud but humble co-owner of the Green Bay Packers and works weekends providing free labor on his wife's fish farm.

Updated: 6 September 2013

United States Navy
Biography

Rear Admiral Michael C. Manazir
Director, Air Warfare (OPNAV N98)



Manazir, the son of a United States Marine, entered the U.S. Naval Academy from Mission Viejo, California, and graduated in 1981. He earned his Naval Aviation wings in April 1983, and deployed in the F-14A in July 1984.

Manazir commanded the Tomcatters of Fighter Squadron 31 (Jun97-Sep98), USS Sacramento (AOE1) (Jan03-Jul04), USS Nimitz (CVN68) (Mar07-Aug09) and Carrier Strike Group 8 embarked in USS Dwight D. Eisenhower (CVN 69) (Sep11-Jun13).

Prior to squadron command, his afloat tours included service as a fighter pilot and Landing Signal Officer aboard various aircraft carriers on the west coast. Following Navy Nuclear Power Training, Manazir served as the Executive Officer of the USS Carl Vinson (CVN 70) (Jul01-Dec02).

Ashore, Manazir served as an action officer in the Office of the Secretary of Defense, on the Chief of Naval Operations staff as F-14 Requirements Officer, and for the Commander, Naval Air Forces, as the Assistant Chief of Staff for Readiness.

As a flag officer, Manazir served as director, Strike Aircraft, Weapons, and Carrier programs on the Chief of Naval Operations Staff (N880) from Aug09-Sep11.

Manazir qualified in the F-14A/D and F/A-18E/F aircraft and has flown more than 3750 hours and 1200 arrested landings during 15 deployments aboard aircraft carriers on both coasts.

He is the recipient of various personal and campaign awards including the Legion of Merit (6), the Defense Meritorious Service Medal, the Meritorious Service Medal (2), and the Strike/Flight Air Medal (2). In 2007, Manazir was recognized as the Tailhooker of the Year by the Tailhook Association. Manazir has been married for 31 years and has two grown children.

Rear Adm. Manazir currently serves as the Director, Air Warfare (OPNAV N98) on the staff of the Chief of Naval Operations (CNO). In this capacity, Manazir is responsible for the development, programming, and budgeting of all U.S. Naval aviation warfighting requirements, resourcing and manpower.

Updated: 20 August 2013

Lieutenant General Jon M. Davis

Deputy Commandant for Aviation



Lieutenant General Jon M. Davis assumed his current position as the Deputy Commandant for Aviation, Headquarters Marine Corps in June 2014.

Commissioned in May 1980 through the PLC Program, LtGen Davis completed the Basic School in August 1980, and then reported for flight training. Upon receiving his wings in September of 1982, he was selected to fly the AV-8A Harrier.

He reported to VMAT-203 in October 1982, completed Harrier training and reported to VMA-231 in 1983 where he deployed aboard the USS Inchon. In 1985 he transferred to VMAT-203 serving as an instructor pilot. In 1986 he attended the WTI course at MAWTS-1. In 1987 he transferred to VMA-223 serving as the "Bulldogs" WTI and operations officer. From 1988 to 1991 he served as an exchange officer with the Royal Air Force. After training in the United Kingdom, he deployed to Gutersloh, Germany for duty as a GR-5/7 attack pilot with 3(F) squadron. From 1991 to 1994 he served as an instructor at MAWTS-1 in Yuma, AZ. From 1998 to 2000 he commanded VMA-223. During his tour, VMA-223 won the CNO Safety Award and the Sanderson Trophy two years in a row, and exceeded 40,000 hours of mishap free operations. After completing the Executive Helicopter Familiarization Course at HT-18 in Pensacola in 2003, he was assigned to MAWTS-1 where he served as Executive Officer and from 2004 to 2006 as Commanding Officer. From 2006 to 2008 he served as the Deputy Commander Joint Functional Component Command -- Network Warfare at Fort Meade, Maryland. He commanded the 2nd Marine Aircraft Wing from July 2010 to May 2012. From May 2012 to June 2014, he served as the Deputy Commander, United States Cyber Command.

His staff billets include a two year tour as a member of the 31st Commandant's Staff Group, and two years as the Junior Military Assistant to the Deputy Secretary of Defense. In 2003, he served as an Assistant Operations Officer on the 3rd Marine Air Wing staff in Kuwait during Operation Iraqi Freedom. In 2004, he served in Iraq as the Officer in Charge of the 3d Marine Aircraft Red Team. He served as the Deputy Assistant Commandant for Aviation from 2008 to 2010. In the course of his career he has flown over 4,500 mishap free hours in the AV-8, F-5 and FA-18 and as a co-pilot in every type model series tilt-rotor, rotary winged and air refueler aircraft in the USMC inventory.

LtGen Davis graduated with honors from The Basic School and was a Distinguished Graduate of the Marine Corps Command and Staff College. He is a graduate of the Tactical Air Control Party Course, Amphibious Warfare School, Marine Aviation Weapons and Tactics Instructor Course (WTI), The School of Advanced Warfighting (SAW), and Johns Hopkins School of Advanced International Studies (SAIS). He holds a Bachelors of Science from Allegheny College, a Masters of Science from Marine Corps University and a Masters of International Public Policy from Johns Hopkins.

His personal decorations include the National Intelligence Distinguished Service Medal, the Defense Superior Service Medal (two awards), the Legion of Merit (two awards), Meritorious Service Medal (three awards), Navy Commendation (three awards) as well as other campaign and service awards.

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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
U.S. HOUSE OF REPRESENTATIVES

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE
HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
U.S. HOUSE OF REPRESENTATIVES

March 26, 2015

SUBJECT: Fiscal Year 2015 Department of Defense Tactical Aircraft Programs

STATEMENT OF: Lt Gen Ellen M. Pawlikowski, USAF
Military Deputy, Office of the Assistant Secretary
of the Air Force (Acquisition)

Lt Gen James M. "Mike" Holmes, USAF
Deputy Chief of Staff
(Strategic Plans and Requirements)

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SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
U.S. HOUSE OF REPRESENTATIVES

I. Introduction

Chairman Turner, Ranking Member Sanchez and distinguished members of the Airland Subcommittee, thank you for the opportunity to provide an update on the United States Air Force's Force Structure and Modernization. Effectively balancing our scarce budget resources across readiness, modernization, and force structure accounts is arguably now more important than ever before.

The United States Air Force is the most globally engaged air force on the planet. Whether dropping bombs, commanding satellites in space, delivering humanitarian relief, or protecting the homeland with an array of air, space, and cyberspace capabilities, American Airmen are in constant defense of our national interests. Alongside its Sister Services, the Air Force delivers the power, influence, agility, and global reach no other country currently possesses. But 24 years of continual combat operations, coupled with constrained and unstable budgets, has taken its toll. America needs a force ready for a spectrum of operations more global and complex than ever before. Instead, a relentless operations tempo, with fewer resources to fund, coordinate, and execute training and exercises, has left a force proficient in only those portions of the mission necessary for current operations. While the Fiscal Year 2016 President's Budget (FY16 PB) takes a critical step toward recovery, we remain stressed to deliver what the Nation asks of our Air Force.

II. Current Environment

After more than two decades of nonstop combat operations, dominant trends point to a complex future that will challenge the Air Force in new and demanding ways. Adversaries are emerging in all shapes and sizes, and the pace of technological and societal change is increasing—with a corresponding increase in the demand for airpower. Furthermore, we cannot buy our way out of this one; we realize that it is time for the Air Force to think differently. Accordingly, senior Air Force leaders have developed a single, integrated strategy to guide the way our service organizes, trains, and equips the force to conduct future operations. Our strategy

points the way forward and does not limit us to an intractable view of the future. It is actionable, with clear goals and vectors for implementation, assessment, and revision. A strategy-driven, resource-informed plan that emphasizes strategic agility will enable the Air Force to meet twenty-first century defense challenges.

The Air Force's new strategic framework will guide us as we move forward. Last summer, we released the Air Force's strategic vision in America's Air Force: A Call to the Future. We are about to release the USAF Strategic Master Plan (SMP), which translates the conceptual strategy in A Call to the Future into comprehensive guidance, goals, and objectives. Together these documents will drive the Strategy, Planning, and Programming Process that will arm and empower the Air Force, in collaboration with our partners, to defeat adversaries and defend the nation and our allies in a complex future. An upcoming Air Force Future Operating Concept will further illuminate this strategy by broadly depicting how an agile, inclusive, and innovative Air Force should employ capabilities in the future.

Understanding that we cannot "see" into the future, four emerging trends provide a strategic context for the strategy. The Air Force will need to win in complex battlespaces characterized by: rapidly changing technological breakthroughs, geopolitical instability, a wide range of operating environments, and an increasingly important and vulnerable global commons. These trends will shape the operational environment, and highlight the broader strategic issues for national defense.

The Air Force will be proactive in meeting these challenges. As A Call to the Future states, "We must commit to changing those things that stand between us and our ability to rapidly adapt." Faster adaptation and response—what we call strategic agility—will sustain the Air Force's unique contributions that are critical to the nation. Agility is the counterweight to the uncertainty of the future and its associated rate of change. We will take significant, measurable steps to enhance our ability to wield innovative concepts and advanced capabilities in unfamiliar, dynamic situations.

By embracing strategic agility, the Air Force will be able to move past the twentieth century's industrial-era processes and paradigms and be ready for the globally connected, information-based world of the coming decades. This approach requires an inclusive Air Force culture that fosters diversity of thought and inculcates a multi-domain mindset to solve challenges that span across traditional Air Force mission sets. We will become more agile in the

ways we cultivate and educate Airmen and in how we develop and acquire capabilities. Our operational training, employment, organizational structures, and personnel interactions will also become more agile to suit the dynamic security environment.

The soon-to-be released Strategic Master Plan (SMP) describes what we will do to implement strategic agility. It translates strategic vision into action by providing authoritative direction for service-wide planning and prioritization. The SMP includes four annexes—"Human Capital," "Strategic Posture," "Capabilities," and "Science and Technology"—that provide more specific guidance and direction, further aligning the SMP's goals and objectives to future resource decisions. An ambitious and far-reaching undertaking, the base SMP will be updated every two years, with the annexes reviewed annually, to ensure a consistent and relevant connection between today's realities and tomorrow's potential. Certain sections will remain classified to ensure critical elements of the future force stay linked to the overall strategy.

The Air Force strategy and the SMP provide authoritative guidance to planners across the Air Staff and major commands. These planners will align their supporting plans with the goals and objectives of the SMP as they apply their expertise to inform planning and resourcing. The guidance and direction in the SMP are designed to enable better enterprise-wide solutions to challenges and close the gaps that can form in execution. In this more robust strategy-driven environment, commanders and staffs will have proper direction and the necessary authority to reach goals by working discrete but connected actions—epitomizing the balance of centralized control with decentralized execution.

This summer, the Air Force will release a new Air Force Future Operating Concept that will further inform strategic planning by describing how we will use future Air Force forces to accomplish our five core missions across the range of military operations. A natural companion to the SMP, this document will provide an innovative portrayal of how an agile, multi-domain Air Force will operate in 20 years' time. It will describe future integrated operations in terms of broad capabilities and the key competencies we desire in future Airmen, and explain how these capabilities and competencies will address anticipated challenges in the future environment. The concept will depict a desired future Air Force that is the product of two decades of successful evolution in strategy-informed planning and resourcing; furthermore, it will serve as a baseline for continued concept development, experimentation, and refinement.

Because strategy is not prescient, it must be adaptive as it seeks to balance the present with the future. There are no easy choices, and there is no time to lose—but the Air Force must make the right prioritization decisions now in order to be prepared to respond in the face of uncertainty. Our strategy-driven, resource-informed approach will enable us to achieve the strategic agility we need to meet twenty-first century defense challenges in a complex world.

III. Operations Update

The Air Force flies and fights in air, space, and cyberspace—globally and reliably—as a valued member of our Joint and Coalition teams. Approximately 205,000 Total Force Airmen are "committed in place" supporting daily Combatant Command (COCOM) operations to defend the homeland, provide command and control of our nuclear forces, operate remotely piloted aircraft, provide rapid global mobility, and many other requirements. Approximately 23,000 Airmen are deployed across the globe, including more than 16,000 in the U.S. Central Command Area of Responsibility. The Air Force is an active partner in Department of Defense planning that will shift our emphasis from today's wars to a broader range of challenges and opportunities. The Department of Defense is currently reassessing the strategic guidance issued last year, but we anticipate continued emphasis on and planning for a rebalance to the Asia Pacific region. Our challenge is to provide those who deploy in support of our global commitments an Air Force that is capable, agile, flexible, ready, and technologically advanced.

During 2014, Air Force aircraft flew over 87,000 sorties in support of Overseas Contingency Operations (OCO). On the home front, Air Force fighter, air refueling, and early warning aircraft have flown over 67,000 total sorties supporting Operation Noble Eagle since September 11, 2001. As a testament to the capability of our Total Force, the Air National Guard and Air Force Reserve have flown more than 65 percent of these sorties.

Today, the Air Force is actively engaged in two major efforts; providing training and operational support to strengthen the Afghan Security Forces and Afghan Air Force in Afghanistan as part of Operation Freedom Sentinel (OFS) and the United Nations' International Security Assistance Force (ISAF) Resolute Support mission, and conducting operations against the Islamic State (ISIL) in Iraq and Syria as part of Operation Inherent Resolve (OIR).

Our objectives as part of OFS are a Counter-Terrorism (CT) mission against the remnants of al-Qaeda and the NATO Resolute Support Train, Advise, and Assist (TAA) mission in support of Afghan security forces. The CT and TAA efforts are concurrent and complementary. While the U.S. and Afghan forces continue to attack the remnants of al-Qaeda, we are also building the Afghan National Defense & Security Forces (ANDSF) so that they can secure the Afghan people and contribute to stability throughout the region. Both of these efforts will contribute to a more secure and productive Afghanistan and prevent the re-emergence of terrorist safe havens.

The U.S. Air Force has helped develop the Afghan Special Mission Wing (SMW), which provides the Afghan Special Security Forces (ASSF) with the operational reach and manned Intelligence, Surveillance, Reconnaissance (ISR) capability to support counter terrorism and counter narcotics missions. The SMW is now executing long-range, full-mission profiles in low illumination. Working together with the ASSF, the commando units and SMW are consistently running unilateral direct action missions against insurgent leaders and facilitators.

The ISAF Resolute Support mission provides training, advice and assistance in eight key areas: multi-year budgeting; transparency, accountability and oversight; civilian oversight of the Afghan Security Institutions; force generation; force sustainment; strategy and policy planning, resourcing and execution; intelligence; and strategic communications. U.S. Air Force advisors work to develop the Afghan Air Force across their entire air enterprise—from fixed and rotary wing operations and maintenance, to engineering and logistics, to force development and helping them build a budget. The Afghan Air Force operates the Mi-17 transport helicopter, Mi-35 attack helicopter, Cessna 208B basic trainer and light lift aircraft, MD-530 light attack helicopter and the C-130 medium lift Hercules. Additional efforts are underway to include the A-29 Super Tucano light air support fighter, with future Afghan pilots currently in training in the U.S. In the last year, the Afghan Air Force has taken over much of the mission, providing casualty evacuation and aerial attack in support of Afghan ground forces and are providing the majority of helicopter and much of the fixed wing maintenance.

Our objectives as part of OIR are to support Iraqi and Kurdish forces on the ground as they take the fight to ISIL and to disrupt ISIL's use of Syria as a safe haven and degrade its

ability to sustain itself via resupply, finance, and command and control. U.S. Airpower has already achieved positive effects in Iraq and Syria. By virtue of the pressure we're putting on ISIL from the air, we've changed their tactics and the way they communicate: they've dispersed, they're hiding among the population more, and they aren't as free to operate as they once were. In Iraq and Kobani, Syria, airstrikes and resupply efforts have helped Iraqi and Kurdish forces to retake and hold key territory, although the situation on the ground remains dynamic. In Syria, airstrikes have attacked ISIL command and control (ex: headquarters buildings), logistics (training camps & vehicle staging areas), and revenue sources (modular oil refineries), making it harder for ISIL to sustain itself as a fighting force.

The U.S. Air Force takes great care in everything from our intelligence collection and analysis to our choice of weapons used for targeting to minimize the chance of harming civilians. No other military in the world takes the responsibility to protect civilians more seriously than we do. In addition, the U.S. Air Force has alleviated civilian suffering in Iraq through delivery of 131,000 meals, 58,000 gallons of water, and other vital supplies via airdrops in the vicinity of Mt. Sinjar and Amirli—and, more importantly, by providing advice and training that have enabled the Iraqi air force to continue independent humanitarian relief and operational resupply efforts.

Despite differences, the U.S. and our International Coalition partners are united over the long term against the common threat posed by ISIL. More than a dozen nations are supporting air operations against ISIL, where they are responsible for more than 20 percent of all sorties and more than 15 percent of all strikes. More than 40 nations have expressed willingness to participate in the effort against ISIL, and more than 30 nations have indicated their readiness to offer military support. All 22 nations of the Arab League have adopted a resolution calling for comprehensive measures to combat ISIL.

Despite these successes, we recognize there are limits to what U.S. Airpower can accomplish. Airstrikes alone will not achieve our full military objectives. The forces that matter most are indigenous ground forces. We have an Iraq-first strategy: air operations in Syria help shape conditions in Iraq. This is going to be a long, difficult struggle that requires strategic patience.

IV. Force Structure and Modernization

Fighters

Air Force fighter force structure is dependent on both fighter aircraft and rated manning. Four years ago, the Air Force determined through extensive analysis that a force structure of 1,200 primary mission aircraft and 2,000 total aircraft was required to execute the National Military Strategy with increased operational risk. Three years ago, based on the 2012 Defense Strategic Guidance (DSG) and fiscal constraints, the Air Force rebalanced our force structure across core functions. Analysis showed the Air Force could decrease fighter force structure by approximately 100 aircraft with higher risk, resulting in the current fighter requirement of 1,100 primary mission aircraft and 1,900 total aircraft. The 2014 Quadrennial Defense Review (QDR) Report also advances an updated national defense strategy that embodies and builds on the DSG priorities. The Chairman's assessment of the QDR strategy states we will continue to need capabilities that can operate effectively in contested environments. During the build of the FY15 budget, fiscal constraints led to a plan for force structure divestments of 334 fighters, leaving a fighter force structure significantly below the 1,900 total aircraft requirement. Fiscal pressures continue to drive these tough choices—balancing today's needs against tomorrows—and accepting near-term risk today to be ready and viable tomorrow.

The Air Force's fighter fleet is approaching 30 years old on average—the oldest in our history. Without service life extensions and capability upgrades, it will not be possible to manage risk. The Air Force is pursuing programs that will modernize and extend the service life of our remaining fleet. The F-35 is a key component in preserving future force structure and mitigating risk. Any further delay in the F-35 program will create a serious shortfall (mid and far-term) in fighter capabilities and force structure. The Air Force is very concerned with recent budget reductions and continues to monitor how these cuts will affect risk. Air Force modernization of legacy systems was traded to pay for readiness and continue to fund our top three investments. It is absolutely critical that selected fourth generation sustainment and modernization efforts continue, the F-22 continues to modernize, and the F-35 matures and begins Full Rate Production (FRP) to avoid further increases in risk.

Manning our current force is a challenge we continually work. Air Force mission success depends on efficient management of our rated force, the most challenging of which is fighter force structure manning. The Air Force is currently 581 fighter pilots short of the total manning requirement and our projections indicate this deficit will decrease to approximately 450 by 2022. The shortfall evolved from force structure reductions that cut active duty fighter squadrons and fighter training squadrons to a number that cannot sustain billet requirements. As a result, the Air Force is currently unable to produce and experience the required number of fighter pilots across the total force. The Air Force is prioritizing overall available rated manpower to fill our operational cockpits, at significant risk to institutional requirements. Projected impacts include reductions in air-operations expertise during the development of war plans and a gradual erosion of fighter pilot experience in test and training. Recent programming and policy actions raised production and absorption capacities, but current fiscal constraints place the implementation of these actions at risk. In addition, the Air Force created the non-rated 13L Air Liaison Officer (ALO) career field that reduces fighter pilot requirements in the ALO function. However, even with these changes, the Air Force is only able to slow the decline in fighter pilot inventory and will be incapable of meeting our overall requirement for fighter pilot expertise for the foreseeable future. Without these fighter pilots, the Air Force will be very challenged to continue to provide the air supremacy upon which all our other forces depend.

A-10

Beginning in FY16, the Air Force will start to retire the entire A-10 fleet of 283 aircraft, saving approximately $4.2B ($4.7B including cost avoidance). The FY16 budget does not fund future modernization efforts for A-10 aircraft; however, we will continue to sustain the aircraft and keep it operationally viable until 2019. While the A-10 was a steady, stellar performer in recent conflicts, our current force structure is simply unaffordable in today's fiscal environment.. Additionally, the A-10 cannot survive or operate effectively in a highly contested environment where there are more advanced aircraft or air defenses. Other weapon systems, from multi-role fighters to B-1 bombers to remotely piloted aircraft, demonstrated in Iraq and Afghanistan that they can provide effective close air support. These decisions, however, do come with certain risks and potential impacts to the mission. One of the impacts to using other platforms for Close Air Support (CAS) is that use of these platforms for CAS must be balanced with their other

missions, putting stress on the force in certain scenarios. Divesting the entire fleet enables us to harvest savings we could then apply to efforts that allow us to be ready and viable tomorrow.

F-16

Our primary multi-role fighter aircraft, the F-16 comprises 50 percent of our fighter fleet. The FY16 budget request invests $1.0B across the Future Years Defense Plan (FYDP) for F-16 modernization and service life extension to meet critical warfighter needs to 2025 and beyond. The majority of efforts in the FYDP focus on Legacy Service Life Extension Program (SLEP), Operational Flight Program (OFP) enhancement, upgrades to the Modular Mission Computer (MMC) and Programmable Display Generator (PDG), and upgrades to the Multifunctional Information Distribution System (MIDS).

Legacy SLEP will extend the airframe structural service life for 300 aircraft by approximately 25 percent from the current 8,000 hours to 10,000+ hours, adding about eight to ten years. The FY16 budget request continues design and development of structural modification kits for the Block 40-52 fleet to be responsive to the Air Force's total fighter requirement. The FY16 budget request for OFP enhancement will continue the integration of new weapons, avionics and improved targeting pods. The MMC and PDG upgrade will resolve processor, memory, and bandwidth issues that will allow capability growth through future OFP development. The MIDS upgrades will improve operational Link 16 reliability while also incorporating frequency remapping, crypto upgrades and growth capability.

F-15 C/D

The FY16 budget request retains 17 of the 51 F-15C/Ds divested in the FY15 budget request to ensure Air National Guard squadrons retain sufficient aircraft to perform their missions. The FY16 budget request invests approximately $1.7B across the FYDP on modernization and sustainment programs for the F-15C/D fleet. We project the F-15C/D fleet will remain viable until at least 2040, with potential for an airframe service life extension following full-scale fatigue testing. This test is underway and will conclude in 2016. The Air Force manages the fleet through scheduled field and depot inspections under an individual aircraft tracking program.

We continue to modernize our F-15C/D fleet with Active Electronically Scanned Array (AESA) radars, a more capable aircraft mission computer, an infrared frequency targeting sensor, a more robust and powerful data link, and a new electronic warfare (EW) self-protection suite, the Eagle Passive/Active Warning Survivability System (EPAWSS). This EW system will be absolutely crucial to ensuring the F-15C/D is able to operate into the future, especially in contested environments. We expect these efforts to enable 196 F-15C aircraft to operate safely and effectively through at least 2040 as determined by the full-scale fatigue test.

F-15E

The FY16 budget request invests approximately $2.2B across the FYDP for F-15E modernization and sustainment programs. This request includes integrating the latest precision weapons to hit targets accurately with reduced collateral damage, and adding a more robust and powerful data link to ensure the aircraft can accurately and securely be assigned targets when in support of ground units. Finally, we are adding a state-of-the-art AESA radar system with advanced capabilities to identify and engage targets, a more capable aircraft mission computer, and an improved self-protection electronic warfare system (EPAWSS). As with the F-15C/D, the EPAWSS system will be absolutely crucial to ensuring the F-15E is able to operate into the future in contested environments. The Air Force expects the F-15E to be an integral part of the Nation's force through at least 2040. A full-scale fatigue test, due to be complete in 2018, will provide data regarding the feasibility of a service life extension.

Fifth Generation Fighters

Fifth generation fighters like the F-22A and F-35 are vital elements of our nation's defense and deterrent capability. These advanced, state-of-the-art aircraft are absolutely essential to maintain our current global air superiority that permits air, sea, and ground forces freedom of action. Each aircraft possess exclusive, complimentary, and indispensable capabilities that provide synergistic effects across the spectrum of conflict. While our potential adversaries continue to modernize, our legacy fourth generation aircraft are rapidly approaching the end of their effective service lives and are limited in their capability to operate in a highly contested environment. Our Air Force must rapidly re-capitalize our fourth generation aircraft. At the same time, we must sustain and modernize our fifth generation fleet in order to maintain

our ability to execute our National Defense Strategy in the near to mid-term while looking even further into the future at further modernization efforts that ensure continued dominance of American Airpower.

F-22

The F-22 Raptor is the only operational U.S. fighter currently capable of operating in highly contested environments. F-22 attributes of stealth, super cruise, integrated avionics and sensors combine to deliver the Raptor's unique operational capability. F-22 modernization is required to counter advancing threats that specifically target F-22 capabilities. Focused on maintaining operational superiority against the evolving threat, the FY16 budget request for F-22 modernization includes $403.2M in RDT&E and $202.4M in procurement. Increment 3.1 delivers advanced air-ground capabilities including Synthetic Aperture Radar (SAR) ground mapping, threat geolocation, and Small Diameter Bomb (SDB) I carriage. Increments 3.2A and 3.2B remain on track for fielding in 2015 and 2018 respectively, and will deliver advanced electronic protection and combat identification, AIM-120D and AIM-9X missile capability, and significantly-improved ground threat geolocation.

The F-22 is operating safely worldwide. It has been 36 months since the last unknown-cause hypoxia-like event occurred. Notably, the retrofit of the Automatic Back-up Oxygen System is on track for completion in 2015.

F-35

During FY16, the Air Force will continue to manage risk across the global precision attack portfolio by prioritizing investment in fifth-generation aircraft while sustaining legacy platforms as a bridge to the F-35 Joint Strike Fighter. The aforementioned legacy fighter modifications are intended to keep a viable air superiority fleet in operation as the F-35 program works toward Initial Operational Capability (IOC) in 2016.

The multi-role F-35A is the centerpiece of the Air Force's future fighter precision attack capability, and it is of vital importance to our nation's security, forming the backbone of U.S. air combat superiority for decades to come. In addition to complementing the F-22's world class air superiority capabilities, the F-35A is designed to penetrate air defenses and deliver a wide range

of precision munitions. This modern, fifth-generation aircraft brings the added benefit of increased allied interoperability and cost-sharing across Services and eight partner nations. The FY16 budget request includes $6.7B for continued development and procurement of 44 F-35A, conventional take-off and landing (CTOL) aircraft.

The F-35 program reached several training milestones in 2014. May 28, 2014 marked delivery of the 26th and final F-35A CTOL to Eglin AFB, making the 58th Fighter Squadron the first complete Air Force F-35 unit. Earlier in the year, the Pilot Training Center at Luke AFB received its first F-35A, and through the end of 2014, Luke's inventory included 17 U.S. F-35A aircraft. On 24 Jul 14, AU-1, Australia's first F-35A rolled off Lockheed Martin's Fort Worth assembly line. AU-2 was delivered in late 2014, joining AU-1 in the inventory at Luke. On Aug 7, 2014, the inaugural F-35A Crew Chief Mission Ready Airman class graduated nine airmen, paving the way for thousands of future F-35 maintainers.

Like every developmental program over the past 50 years, the F-35 program has made discoveries during test and development that have been and continue to be addressed and corrected. This is to be expected, and the Air Force remains confident in the program, as it continues to make solid and steady progress toward fielding the required capabilities to meet the Air Force's IOC criteria in 2016. In May 14, the test team completed an AIM-120 weapons delivery accuracy test that was the first live fire Advanced Medium Range Air-to-Air Missile (AMRAAM) mission for the F-35B Short Take-off, Vertical Landing (STOVL) and the first dual AIM-120 launch for any variant. Also in May, the program completed its first test missions with Block 3i software, a critical step for Air Force IOC. In late summer 2014, the first F-35A night CAS tests occurred at the National Training Center at Fort Irwin. A Joint Terminal Attack Controller (JTAC) used a laser designator to interact with the F-35 electro-optical targeting system, and the JTAC communicated with the F-35 pilots via electronic and voice messaging systems, successfully identifying ground targets. This successful demonstration of CAS capability was a major step toward IOC. To close out 2014, the test team successfully conducted multiple Joint Direct Attack Munitions (JDAM) and AMRAAM weapons delivery accuracy tests and accomplished multiple SDB I weapons releases during a single delivery pass, a first for the program.

While the program achieved substantial development and test progress in 2014, the test program experienced delays due to an engine anomaly at Eglin AFB in June. Throughout the summer and into the fall, the Joint Program Office (JPO), Service System Commands and industry worked diligently to analyze the problem, prioritize test assets and return to flying status in a safe, methodical fashion. The program was subsequently able to determine root cause and developed an interim solution: a "pre-trenched" rub material that will be implemented in the field later this year. Pratt and Whitney has agreed to cover the costs for the repairs to engines in the field and the cut-in of the solution to the production line, while the program office will pay for the design activity as per the development contract. The program continues its work on a long-term fix to the engine and expects to review and select from the design solutions this spring, followed by design and qualification testing, and finally, incorporation of the solution into the production line. This work is expected to be completed in 2015.

Today, the program is on the road to initial operational capability (IOC) for the Air Force, and we expect the warfighter to be able to declare IOC as planned in 2016. Flight test for Block 2B is nearing completion and is underway for Block 3i, formal training operations at Luke AFB are set to begin in May, and first aircraft arrival is projected for Hill AFB in August. The first two F-35A aircraft are in place at Nellis AFB to support tactics development for the warfighter, and we project over 25 more F-35A aircraft to deliver through the end of 2015, including the first deliveries for our Norwegian and Italian partners. Going forward, we will continue to closely monitor progress toward IOC, including completion of development and flight test for Block 2B/3i, final resolution to the engine issue, and continued maturation of Autonomic Logistics Information System, a system that is critical to F-35 operations at home and abroad. The Air Force will also continue to watch progress for Block 3F (full warfighting capability), currently projected to complete 4-6 months later than planned. In FY16, the Air Force plans to procure 44 F-35A CTOL aircraft. Sequestration did not affect Air Force procurement quantities in 2015. Affordability remains a major priority, and the F-35 program continues to make great strides on this front. The price of F-35s continues to decline steadily Lot after Lot. For example, the price of a Lot 7 F-35A was 4.3 percent less than a Lot 6 F-35A aircraft and a Lot 8 F-35A aircraft was 3.6 percent less than a Lot 7 F-35A, including the engine and profit for both contractors. Reductions are expected to continue into the future, leveraging

the program's on-going affordability initiatives. By 2019, the expected price of an F-35A, with an engine and including profit, is expected to be between $80 and $85 million, in 2019 dollars.

Air-to-Surface Weapons

All three mission areas (Stand-Off, Direct Attack, and Penetrator munitions) in the Air-to-Surface munitions inventory are short of inventory objectives. Joint Air-to-Surface Standoff Missile (JASSM) and SDB weapons along with Low Observable platforms are force multipliers in a highly contested environment and their shortage could increase friendly force attrition driving a much higher level of effort enabling the attack of other critical targets. The shortage of penetrator weapons will result in some inability to target adversary critical capabilities and increase risk. Combat operations and support for our coalition partners in Iraq and Syria are reducing the direct attack munitions (JDAM) inventories faster than we are procuring them. These combat operations are expected to continue long term (3+ years). Combat expenditures have been replaced using OCO funding; however replenishment takes over three years. Direct attack munition shortages drive the use of non-preferred munitions with decreased effectiveness and resulting in increased time and Air Force attrition to accomplish COCOM objectives.

JASSM and JASSM-ER

JASSM and JASSM-ER (Extended Range) are currently the nation's only stealthy, conventional, precision, launch-and-leave, standoff missiles capable of fighter and bomber aircraft employment. They are capable of penetrating next generation enemy air defenses to strike high value, hardened, fixed, or mobile targets. The JASSM (baseline) has a range greater than 200nm while the JASSM-ER has a range greater than 500nm.

The JASSM (baseline) weapon is in FRP; the 12th production contracts was awarded to Lockheed Martin on December 19, 2013, for 150 missiles. About 1,360 missiles have been delivered; about 230 of these are undergoing warranty repair, for surface wrinkling due to exposure to high humidity conditions. A new coating (starting at lot 8) has corrected the surface wrinkling problem. FY16 is the last JASSM (baseline) buy for a total procurement of 2,034 missiles.

JASSM-ER starts FRP in FY15, after completing 4 low-rate initial production (LRIP) lots. The 4th LRIP contract was awarded to Lockheed Martin on December 19, 2013, for a total of 60 missiles. Currently, 60 missiles have been delivered, and the Air Force declared JASSM-ER IOC on the B-1B on December 2, 2014. In FY17, the JASSM production line transitions to JASSM-ER at the most efficient rate of 360 missiles per year. The last JASSM-ER procurement is planned for FY23, for a total of 2,866 missiles.

SDB I and II

The Air Force was short of the SDB I inventory objective and had ceased procurements prior to current operations. The combat operation in Iraq and Syria is the first time we have expended significant numbers of SDB I. In FY16, the Air Force plans to procure an additional 1,692 SDB I. In addition, the FY16 OCO request would replenish 63 combat expenditures.

The SDB II uses a multi-mode seeker and dual band weapon data link to attack mobile targets at stand off range. SDB II will provide a four-fold increase in load out. Its carriage system will allow initial combat forces to achieve operational objectives early in conflicts. Initially, the F-15E (Air Force threshold), F-35B & C (Department of the Navy threshold), F/A-18E/F and AC-130W will carry the SDB II.

SDB II is in Engineering, Manufacturing and Development with an LRIP decision planned by the end of this fiscal year. In FY15, SDB II will continue developmental and live fire testing and conduct government confidence test shots. The FY15 procurement funds buy 144 weapons with deliveries starting in FY16. The Air Force's total planned procurement for SDB II is 12,000 weapons.

Air-to-Air Weapons

Air-to-Air missile inventories are short of objectives. AIM-120 AMRAAM and the AIM-9X continue to be in short supply. These weapons enable the joint force to achieve Air Superiority with a first look first kill capability. The shortage of Air-to-Air missiles delay achievement of Air Superiority, and will decrease the time the Joint Force can maintain Air Superiority,. Adversary capabilities continue to challenge the Joint Force's historical advantage in the air superiority arena.

AIM-120D AMRAAM

The AIM-120 Advanced Medium Range Air to Air Missile (AMRAAM) is the Department of Defense's premier beyond-visual-range missile to counter existing and emerging air vehicle threats, it operates at high or low altitude with electronic attack capabilities. AMRAAM is a key enabler for gaining air superiority and air dominance for the F-15, F-16, F/A-18, F-22 and eventually F-35. It provides the ability to achieve multiple kills per engagement. The latest evolution of AMRAAM is the AIM-120D. Itincreases range and kinematics, improves high off-boresight targeting, and enhances two-way data link for improved accuracy and lethality at range. The Air Force is the lead service in partnership with the Navy.

The AIM-120D completed operational testing in July 2014. The Navy fielded the missile and declared IOC for the F/A-18E/F on January 7, 2015. The Air Force expects IOC in the 3QFY15. Total procurement for FY15 is 200 units. The program will continue to update the AMRAAM technical data package to ensure a viable, producible design through the production life of the AMRAAM program, and to maintain a robust supplier base for the life of the program.

CV-22

The current CV-22 fleet of 43 aircraft is fully funded and provides transformational mission capability to Special Operations Forces. The Air Force executed its final buy of four aircraft in FY14, which included one congressionally added Operational Loss Replacement (OLR) aircraft. Declaration of full operational capability is scheduled to follow delivery of the last CV-22 in the first quarter of FY17,for a total of 50 operational Air Force Special Operations Command aircraft.

The V-22 Joint Program Office is executing an aggressive improvement program through block upgrade development efforts. The CV-22 program office is also focused on improving engine propulsion system reliability and overall aircraft sustainability. In FY16, development continues on the Improved Inlet Solution (IIS) to address foreign object ingestion.

In addition to these critical engine upgrades, the Air Force continues to make other improvements to the CV-22. The on-going Communication, Navigation, Surveillance/Air Traffic Management (ATM) modification will enhance navigation system accuracy and upgrade

the aircraft identification friend or foe system. The aircraft electrical power system upgrade is an FY16 new start effort to replace an obsolete component and improve the aircraft's electrical power generation and distribution system. The Air Force also continues to develop and install modifications designed to improve reliability, maintainability, safety, deployability, and mission effectiveness. Future modifications and improvements will make the CV-22 even more reliable, capable, and cost-effective.

Combat Rescue Helicopter (CRH)

The Air Force is the only Service with organized, trained, and equipped to execute theater-wide Personnel Recovery. Due to the advancing age and current attrition rates of the HH-60G, the Air Force must continue to modify existing HH-60G helicopters while utilizing the Operational Loss Replacement program to meet Combatant Command requirements. The newly designated HH-60W will be specifically equipped to conduct Combat Search and Rescue across the entire spectrum of military operations. Moreover, this weapon system is called on to support the larger Personnel Recovery architecture through the execution of medical evacuation, casualty evacuation, humanitarian relief operations, non-conventional assisted recovery, humanitarian assistance, defense support of civil authorities, search and rescue, and non-conventional evacuation operations missions. This new platform will continue the legacy of rescue established by the HH-60G through.

In addition to 112 HH-60Ws, the CRH program provides for training devices, support equipment and post production support as a replacement for the HH-60G. The Air Force awarded the engineering, manufacturing, and development contract to Sikorsky Aircraft Corporation in June of 2014 with an initial obligation of $1.28B. This program will hold a preliminary design review in FY16 and is targeting an IOC in FY21. The AF has fully funded the CRH program.

RQ-4 and U-2

The decision to retain the RQ-4 while retiring the U-2 remains unchanged in the FY16 budget request. The Air Force will have less force structure, capacity, and Intelligence,

Surveillance, and Reconnaissance (ISR) support to conventional high-altitude wartime ISR requirements compared to keeping both the U-2 and RQ-4 Block 30 forces. However, the department determined that the RQ-4 Block 30 force structure is sufficient when combined with other capabilities. Some losses in ISR capability and capacity can be mitigated with upgrades to the RQ-4 over the next 5 to 10 years and by utilizing the larger ISR capability portfolio. Even with our best mitigation measures, some increased risks to combat and peacetime ISR collection remains. However, the Department is willing to accept some risks while focusing on the ISR core competencies and long term affordability.

Command and Control (C2)

Command and Control, enables all other Air Force Core Functions. The Air Force's C2 strategy provides sufficiently robust, scalable, flexible, and rapidly deployable C2 capabilities, enabling commanders to fully exploit air, space and cyberspace capabilities. In the FY16 budget request, the Air Force leverages some of the sequestration relief provided by the Bipartisan Budget Act (BBA) to increase investment in C2 capabilities. Specifically the FY16 budget request supports the Air and Space Operations Center (AOC), E-8C Joint Surveillance Target Attack Radar System (JSTARS) and JSTARS Recapitalization, E-3 Airborne Early Warning and Control System (AWACS), and Three-Dimensional Expeditionary Long Range Radar (3DELRR) programs. The Air Force is requesting FY16 funds to continue modernizing the AOC, and the E-3 AWACS while recapitalizing the E-8C JSTARS mission area. In October 2014 the 3DELRR program awarded a development contract, currently in litigation, for a new ground based sensor.

E-8C JSTARS and JSTARS Recapitalization

The E-8C JSTARS is the airborne Command, Control, Intelligence, Surveillance, and Reconnaissance (C2ISR) platform for air-to-ground Battle Management operations. It provides long-endurance, all-weather, surveillance and targeting of moving and stationary targets via Ground Moving Target Indicator (GMTI) and SAR technology.

Based on the results of the Airborne SAR/MTI JSTARS Mission Area AoA in 2011, the Air Force has begun a JSTARS Recapitalization (Recap) effort. The JSTARS Recap, seeks to

replace the legacy E-8C with affordable commercially available aircraft, reducing operation and sustainment costs by 27 percent compared to the E-8C. The new platform will reduce the logistics footprint and improve operational capability with an advanced ground surveillance radar and on-board battle management suite.

JSTARS Recap will continue to provide a unique blend of on-board Battle Management Command and Control (BMC2) and ISR capabilities that enable the central tenet of Air Forces doctrine "Centralized Control and Decentralized Execution". Crews onboard the JSTARS use its wide area ground surveillance radar to build situational awareness and identify targets which are passed to strike assets or crossed cued with ISR platforms. The capability to perform this dual mission at the tactical edge provides C2 mission assurance in a contested environment.

The USAF is fully committed to the JSTARS mission. The E-8C and JSTARS Recap acquisition are fully funded in the FYDP. To ensure we continue maintaining the command and control and battlespace awareness capabilities requested by Combatant Commanders, the USAF intends to maintain the legacy E-8C fleet until the new JSTARS Recap fielding begins. JSTARS Recap is slated for IOC in FY23 and our plans are to procure a total of 16 aircraft.

E-3 AWACS

The E-3 AWACS fleet is the Department of Defense's airborne surveillance and BMC2 weapon system. AWACS is a key airborne element of the TACS and provides BMC2, Battlespace Awareness (BA) and Decision Superiority (DS). As a rapidly deployable system, the E-3 is often the first surveillance and BMC2 capability in theater. Current modernization efforts focus on upgrading the battle management mission systems, combat identification and the cockpit avionics suite. These upgrades provide AWACS with the computing and communications architecture required for participation in a net-enabled battlespace, as well as avionics free from Diminishing Manufacturing Source (DMS) issues and mandated for continued worldwide airspace navigation. AWACS is also modernizing its wide-band communication capability to allow for netcentric operations and data exchange with other weapon systems and elements of the enterprise, as well as performing sensor upgrades to mitigate the effects of advanced electronic attack in contested environments.

With the implementation of the modernization programs, AWACS execute the National Military Strategy, but the platform will require future initiatives to address emerging adversarial threats and for effective participation in coalition or joint networked battlespace. Future capability enhancements will depend on the priority and phasing of funding relative to other Department of Defense efforts, and difficult choices will be required to live within the constraints.

Under the continuing fiscal constraints, the Air Force will maintain the 31 aircraft fleet and plans to reduce from 31 to 24 aircraft in FY19. This will allow the AWACS fleet to retain critical modernization programs needed for Joint Air Command and Control in highly contested environments. Additionally, evidence of increased corrosion and aging aircraft issues are becoming more prevalent, leaving the AWACS fleet struggling to consistently meet Air Combat Command's Mission Capable Requirement. To resolve the capacity shortfall created by the fleet reduction and increasing corrosion/aging aircraft issues, the Air Force is funding an AoA to consider modern and efficient solutions for the follow-on Airborne BMC2 mission.

Airborne Electronic Attack

The Air Force is committed to providing airborne electronic attack capability in support of operations across all operational warfighting domains. The decision to divest half of the fleet of EC-130H COMPASS CALL's in FY16 was a tough decision driven by budgetary constraints. The remaining fleet will continue to support the current fight. The EC-130H COMPASS CALL is required by the COCOMs; the divesture incurs and accepts the risk of nonsupport to all but the currently tasked operations. The Air Force will continue to investigate alternatives for airborne electronic attack capabilities to supplant and rebuild capacity of the existing EC-130H COMPASS CALL fleet as part of the Joint Airborne Electronic Attack Family of Systems concept.

Rapid Global Mobility

The Rapid Global Mobility fleet continues to pursue capability enhancements balanced by recapitalization and required modifications to operate in international airspace and avoid diminishing manufacturing source issues. The KC-46A Pegasus tanker acquisition program is progressing and the first 18 of 179 tankers are slated for delivery in FY17. Even with this

tremendously capable addition to our tanker inventory, when measured against current strategies, the fleet will not meet moderate risk levels until the early 2020s. C-130J production is still set for 142 and, coupled with FAA and European compliance modifications planned for our C-130Hs, ensures our tactical airlift fleet is more than adequate to respond to any task established by national command authorities. The strategic airlift fleet of C-5s and C-17s is adequate to support the million ton miles per day metric established in our most stressed response scenarios.

Aviation Safety

The Air Force continues to incorporate new and improved capabilities to protect our aviators and aircraft. These aviation safety technologies greatly contribute to the continuing long-term reduction of mishaps. Over the last year, mishaps have included multiple engine related mishaps, two mid-air collisions, and two bird strikes. Other mishaps are still under investigation by the Accident Investigation Boards. Historically, tactical aviation losses have commonly involved controlled flight into terrain, G induced loss of consciousness, and spatial disorientation. Recent and planned system safety improvements such as traffic collision avoidance, automatic ground collision avoidance, and automatic emergency backup oxygen systems are addressing these issues. Continued fielding of these safety technologies is essential to preventing mishaps and preserving combat capability.

Industrial Base

When considered in its entirety, the nation's aerospace industrial base is a bright spot in the economy with a favorable trade balance in 2014 of $61.2 billion. However, this success is primarily due to the commercial aircraft sector. The concerns and challenges we expressed in our testimony last year over the future of the aerospace industrial base supporting the Air Force remain. As a nation, we can no longer take for granted the widespread availability of engineering and design teams, production workers, facilities, and equipment required to meet emergent national security requirements. The observations about the capability and capacity of our Air Force made by Secretary James and General Welsh in the Air Force Posture Statement also apply to the aerospace industrial base supporting the Air Force.

As a result of the difficult budget decisions, we have given up industrial capacity to design, develop, produce, and sustain the next generation of military aerospace systems while attempting to maintain some level of capability in those areas. For the next generation of fighter and attack aircraft, the outlook for meaningful competition is guarded. It depends on the nation's ability to allocate and sustain investment sufficient to retain capability and capacity in key areas. Both the Department of Defense and the Air Force are addressing this national challenge. Leadership has invested in programs such as the Defense Department led Aerospace Innovation Initiative and the Air Force's Adaptive Engine Technology Development effort even during these times of fiscal restraint. These focused investments, while sustaining elements of the aerospace industrial base, do not fully address the national commitment required to sustain this nation's role as the global technical leader in military aerospace.

IV. Conclusion

The Air Force continues to be the world's finest across the spectrum of conflict, but the gap is closing. A return to sequestration-level funding would result in a less ready, less capable, less viable Air Force that is unable to fully execute the defense strategy. At FY15 Balanced Budget Act level funding, the Air Force has some ability to manage risk in supporting the strategy, but significant challenges will remain. In order to defeat advancing threats, the Air Force must continue investments in top recapitalization and key modernization programs, and gain and maintain full-spectrum readiness.

Our sister services and allies expect the Air Force to provide critical warfighting and enabling capabilities. We remain focused on delivering Global Vigilance, Reach and Power, through our core missions of Air Superiority, Space Superiority, Global Strike, Rapid Global Mobility, Intelligence, Surveillance and Reconnaissance and Command and Control. We look forward to working closely together as we address the challenges of near-term uncertainty and risk to provide the ability to deliver combat air power for America when and where we are needed.

BIOGRAPHY

UNITED STATES AIR FORCE

LIEUTENANT GENERAL JAMES M. "MIKE" HOLMES



Lt. Gen. James M. "Mike" Holmes is Deputy Chief of Staff for Strategic Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C. In support of the Chief of Staff and Secretary of the Air Force, General Holmes leads the development and integration of the Air Force strategy, long-range plans and operational capabilities-based requirements. He directs and coordinates activities ensuring the Air Force builds and employs effective air, space and cyber forces to achieve national defense objectives.

General Holmes entered the Air Force through Officer Training School in 1981 after receiving a degree in electrical engineering from the University of Tennessee. He has commanded the 27th Fighter Squadron, the 14th Operations Group, the 4th Fighter Wing and the 455th Air Expeditionary Wing. He has served in the Office of the Secretary of Defense and on headquarters staffs of the United States Air Force, U.S. European Command and Pacific Air Forces. Prior to his current position, he was the Vice Commander, Air Education and Training Command, Joint Base San Antonio-Randolph, Texas responsible for the recruiting, training and education of Air Force people, including the Air Force Recruiting Service, a numbered air force and Air University. He is a command pilot with more than 4,000 hours, including more than 500 combat hours in the F-15A/B/C/D/E, and has also flown the T-38, T-37 and T-1A.

EDUCATION

1981 Bachelor of Science degree in Electrical Engineering, University of Tennessee, Knoxville
1986 F-15 Fighter Weapons Instructor Course, U.S. Air Force Fighter Weapons School, Nellis AFB, Nev.
1987 Squadron Officer School, Maxwell Air Force Base, Ala.
1993 Air Command and Staff College, Maxwell AFB, Ala.
1993 Master of Arts degree in History, University of Alabama, Tuscaloosa
1994 Master of Airpower Arts and Sciences degree, School of Advanced Airpower Studies, Air University, Maxwell AFB, Ala.
1995 Armed Forces Staff College, Norfolk, Va.
2000 Air War College, by correspondence
2001 Master's degree in national defense studies, Naval War College, Newport, R.I.
2006 National Defense Studies Fellow, Maxwell School of Citizenship and Public Affairs, Syracuse University, N.Y.
2007 Joint Force Air Component Commander Course, Air University, Maxwell AFB, Ala.
2010 AFSO21 Executive Leadership Course, University of Tennessee, Knoxville
2011 Coalition Force Maritime Component Commander Course, Naval War College, Bahrain
2013 Joint Flag Officer Warfighting Course, Air University, Maxwell AFB, Ala.

ASSIGNMENTS

1. September 1981 - August 1982, Student, undergraduate pilot training, Columbus AFB, Miss.
2. September 1982 - November 1982, Student, fighter lead-in training, Holloman AFB, N.M.
3. November 1982 - April 1983, Student, F-15 conversion training, Luke AFB, Ariz.
4. May 1983 - December 1985, F-15 Instructor Pilot and Assistant Squadron and Wing Weapons Officer, 71st Tactical Fighter Squadron, Langley AFB, Va.
5. January 1986 - May 1986, Student, USAF F-15 Fighter Weapons Instructor Course, Nellis AFB, Nev.
6. May 1986 - May 1989, F-15 Chief of Weapons and Tactics, 44th Tactical Fighter Squadron, Kadena Air Base, Japan
7. May 1989 - June 1992, F-15 Chief of Weapons and Tactics, Assistant Chief of Wing Weapons and Tactics, Flight Commander and Assistant Operations Officer, 7th Tactical Fighter Squadron and 9th Fighter Squadron, Holloman AFB, N.M.
8. July 1992 - June 1993, Student, Air Command and Staff College, Air University, Maxwell AFB, Ala.
9. July 1993 - June 1994, Student, School for Advanced Airpower Studies, Air University, Maxwell AFB, Ala.
10. July 1994 - October 1996, Air Operations Officer and Crisis Action Planner, Operations Directorate, Headquarters U.S. European Command, Stuttgart-Vaihingen, Germany
11. October 1996 - December 1997, Assistant Operations Officer, 27th Fighter Squadron, Langley AFB, Va.
12. January 1998 - May 1999, Operations Officer, 71st Fighter Squadron, Langley AFB, Va.
13. May 1999 - July 2000, Commander, 27th Fighter Squadron, Langley AFB, Va.
14. July 2000 - July 2001, Student, Naval War College, Newport, R.I.
15. July 2001 - August 2002, Chief, Strategy, Concepts and Doctrine Division, Directorate of Operational Plans and Joint Matters, Headquarters U.S. Air Force, Washington, D.C.
16. August 2002 - July 2004, Commander, 14th Operations Group, Columbus AFB, Miss.
17. August 2004 - September 2006, Commander, 4th Fighter Wing, Seymour Johnson AFB, N.C.
18. September 2006 - June 2007, Chief, Checkmate, Directorate of Operational Plans and Joint Matters, Headquarters U.S. Air Force, Washington, D.C.
19. July 2007 - December 2007, Director of Strategic Plans, Programs and International Affairs, Headquarters Pacific Air Forces, Hickam AFB, Hawaii
20. December 2007 - March 2008, Special Assistant to the Director of Operational Planning, Policy and Strategy, Deputy Chief of Staff for Operations, Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C.
21. March 2008 - April 2009, Commander, 455th Air Expeditionary Wing, Bagram Air Base, Afghanistan
22. April 2009 - July 2009, Special Assistant to the Assistant Vice Chief of Staff, and Director, Air Staff, Headquarters U.S. Air Force, Washington, D.C.
23. July 2009 - August 2011, Principal Director for Middle East Policy, Office of the Under Secretary of Defense for Policy, Office of the Secretary of Defense, the Pentagon, Washington, D.C.
24. August 2011 - January 2012, Director, Strategic Planning, Deputy Chief of Staff for Strategic Plans and Programs, Headquarters U.S. Air Force, Washington D.C.
25. January 2012 – July 2013, Assistant Deputy Chief of Staff for Operations, Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C.
26. August 2013 – July 2014 Vice Commander, Air Education and Training Command, Joint Base San Antonio-Randolph, Tex.
27. August 2014 – present, Deputy Chief of Staff for Strategic Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C.

SUMMARY OF JOINT ASSIGNMENTS

1. July 1994 - October 1996, Air Operations Officer and Crisis Action Planner, Operations Directorate, Headquarters U.S. European Command, Stuttgart-Vaihingen, Germany, as a major
2. March 2008 - April 2009, Commander, 455th Air Expeditionary Wing and Senior Airfield Authority, Bagram AB, Afghanistan, as a brigadier general
3. July 2009 - Aug 2011, Principal Director for Middle East Policy, Office of the Under Secretary of Defense for Policy, Office of the Secretary of Defense, the Pentagon, Washington, D.C., as a brigadier and major general

FLIGHT INFORMATION
Rating: command pilot
Flight hours: more than 4,000
Aircraft flown: F-15A/B/C/D/E, T/AT-38, T-37 and T-1A

MAJOR AWARDS AND DECORATIONS
Distinguished Service Medal
Defense Superior Service Medal
Legion of Merit with oak leaf cluster
Bronze Star Medal
Defense Meritorious Service Medal
Meritorious Service Medal with two oak leaf clusters
Air Medal with three oak leaf clusters
Aerial Achievement Medal with three oak leaf clusters
Air Force Commendation Medal with oak leaf cluster
Army Commendation Medal

EFFECTIVE DATES OF PROMOTION
Second Lieutenant Aug. 28, 1981
First Lieutenant Aug. 28, 1983
Captain Aug. 28, 1985
Major May 1, 1993
Lieutenant Colonel Jan. 1, 1998
Colonel July 1, 2002
Brigadier General May 2, 2008
Major General Jan. 28, 2011
Lieutenant General Aug. 2, 2013

(Current as of October 2014)

BIOGRAPHY

UNITED STATES AIR FORCE

MAJOR GENERAL TIMOTHY M. RAY



Maj. Gen. Timothy Ray is the Director of Global Power Programs in the Office of the Assistant Secretary of the Air Force for Acquisition, Headquarters U.S. Air Force, Washington, D.C. He is responsible for the directing, planning and programming of 159 Air Force, joint service and international programs with a $10 billion annual budget.

General Ray received his commission from the U.S. Air Force Academy in 1985. He completed undergraduate pilot training and has held operational flying assignments in the T-38 and B-52, serving as an instructor, evaluator pilot and squadron commander. He has also flown the B-1 and commanded the 7th Bomb Wing at Dyess Air Force Base, Texas. General Ray had various staff assignments at the major command, Headquarters U.S. Air Force and combatant command levels, as well as served as Commanding General, NATO Air Training Command – Afghanistan, NATO Training Mission – Afghanistan/Combined Security Transition Command – Afghanistan; and Commander, 438th Air Expeditionary Wing, Kabul, Afghanistan. Prior to his current assignment, he was Director, Operational Planning, Policy and Strategy, Deputy Chief of Staff, Operations, Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C.

EDUCATION

1985 Bachelor of Science degree in human factors engineering, U.S. Air Force Academy, Colorado Springs, Colo.
1994 Distinguished graduate, Squadron Officer School, Maxwell AFB, Ala.
1998 Master of Science degree in aviation sciences and management, Embry-Riddle Aeronautical University, Daytona Beach, Fla.
1998 Distinguished graduate, Air Command and Staff College, Maxwell AFB, Ala.
2004 Master of Science degree in strategic studies, Air War College, Maxwell AFB, Ala.
2008 Senior Executive Fellow, Harvard University, Cambridge, Mass.

ASSIGNMENTS

1. August 1985 - August 1987, student, undergraduate pilot training, Williams AFB, Ariz.
2. August 1987 - October 1987, student, B-52 combat crew training, Castle AFB, Calif.
3. November 1987 - March 1993, B-52 flight commander, instructor and evaluator pilot, 23rd Bomb Squadron, Minot AFB, N.D.

4. March 1993 - March 1994, B-52 Flying Training Unit instructor pilot, Castle AFB, Calif.
5. March 1994 - June 1997, B-52 FTU instructor pilot and executive officer, 2nd Bomb Wing, Barksdale AFB, La.
6. June 1997 - July 1998, student, Air Command and Staff College, Maxwell AFB, Ala.
7. July 1998 - October 2000, Deputy Chief, Aircraft Team, U.S. Strategic Command, Offutt AFB, Neb.
8. October 2000 - June 2001, operations officer, 11th Bomb Squadron, Barksdale AFB, La.
9. June 2001 - July 2003, Commander, 96th Bomb Squadron, Barksdale AFB, La.
10. August 2003 - June 2004, student, Air War College, Maxwell AFB, Ala.
11. July 2004 - September 2005, Chief, Training, Readiness, Exercises and NEO Division (J37), U.S. Forces Korea, Yongsan Army Garrison, South Korea
12. September 2005 - July 2006, Vice Commander, 5th Bomb Wing, Minot AFB, N.D.
13. July 2006 - June 2008, Commander, 7th Bomb Wing, Dyess AFB, Tex.
14. July 2008 - July 2009, Deputy Director of Air and Space Operations at Air Combat Command, Langley AFB, Va.
15. August 2009 - August 2011, Director of Operations, Air Force Global Strike Command, Barksdale AFB, La.
16. August 2011 – September 2012, Commanding General, NATO Air Training Command - Afghanistan, NATO Training Mission - Afghanistan/Combined Security Transition Command - Afghanistan and Commander, 438th Air Expeditionary Wing, Kabul, Afghanistan
17. September 2012 – January 2014, Director, Operational Planning, Policy & Strategy, Deputy Chief of Staff, Operations, Plans and Requirements, Headquarters U.S. Air Force, the Pentagon, Washington, D.C.
18. February 2014 – present, Director, Global Power Programs, Office of the Assistant Secretary of the Air Force for Acquisition, Headquarters U.S. Air Force, the Pentagon, Washington, D.C.

SUMMARY OF JOINT ASSIGNMENTS
1. July 1998 - October 2000, Deputy Chief, Aircraft Team, U.S. Strategic Command, Offutt AFB, Neb., as a major and lieutenant colonel
2. July 2004 - September 2005, Chief, Training, Readiness, Exercises and NEO Division, Special Operations (J37), U.S. Forces Korea, Yongsan Army Garrison, South Korea, as a lieutenant colonel and colonel
3. August 2011 – September 2012, Commanding General, NATO Air Training Command – Afghanistan, NATO Training Mission – Afghanistan/Combined Security Transition Command – Afghanistan and Commander, 438th Air Expeditionary Wing, Kabul, Afghanistan, as a brigadier general

FLIGHT INFORMATION
Rating: command pilot
Flight hours: more than 4,000
Aircraft flown: T-37, T-38, B-52G, B-52H, B-1B, C-27A and C-208

MAJOR AWARDS AND DECORATIONS
Defense Superior Service Medal
Legion of Merit with oak leaf cluster
Bronze Star
Defense Meritorious Service Medal
Meritorious Service Medal with four oak leaf clusters
Air Medal with oak leaf cluster
Aerial Achievement Medal with oak leaf cluster
Air Force Commendation Medal with oak leaf cluster
Joint Meritorious Unit Award
Meritorious Unit Award
Air Force Outstanding Unit Award with "V" device, six oak leaf clusters
Combat Readiness Medal with two oak leaf clusters
National Defense Service Medal with bronze star
Afghanistan Campaign Medal with two oak leaf clusters
Iraq Campaign Medal with oak leaf cluster
Global War on Terrorism Expeditionary Medal
Global War on Terrorism Service Medal

Republic of Korea Order of National Security Merit (Samil Medal)

EFFECTIVE DATES OF PROMOTION
Second Lieutenant May 29, 1985
First Lieutenant May 29, 1987
Captain May 29, 1989
Major Feb. 1, 1997
Lieutenant Colonel May 1, 2000
Colonel Aug. 1, 2004
Brigadier General Nov. 2, 2009
Major General June 2, 2013

(Current as of March 2015)

WITNESS RESPONSES TO QUESTIONS ASKED DURING THE HEARING

MARCH 26, 2015

RESPONSE TO QUESTION SUBMITTED BY MS. McSALLY

General HOLMES. Ma'am, we project to save $75.1 million in Fiscal Year 2016 by divesting the seven EC–130 aircraft. [See page 14.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 26, 2015

QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. There has been a tremendous amount of discussion over the last 6–9 months in regard to acquisition reform. Can you shed some light on how the Congress could help make the DOD acquisition process more effective and efficient?

Admiral GROSKLAGS. Good acquisition outcomes are more probable when the Department can manage to a plan with a foundation of stable requirements, technical baselines, and budgets. Perpetual instability, as we have experienced over multiple budget cycles, produces a repeatable cycle of spiraling, self-fulfilling cost growth and program delays. Uncertainties as manifested in Sequestration, Continuing Resolutions, and other frequent changes to budgets through the annual authorization and appropriations process are counter to our efforts to effectively execute to a plan. A timely, predictable defense budget (ultimately, a multiple year budget) would directly increase the productivity of Defense acquisition; provide needed stability to the industrial base; and improve both government and industry's ability to manage outlay risk and invest in research and development, facilities, and people. Stable budgets also reduce government deadline pressures to meet artificial obligations or expenditure benchmarks that impact effective contract negotiations. Reducing these pressures would then allow the time necessary to achieve the best deal for the Department and the taxpayer. The DoN also recommends that Congress work with the Undersecretary of Defense for Acquisition, Technology and Logistics in his current effort to identify and roll back legislation that has produced unnecessary and redundant regulatory and reporting burdens to all of our acquisition programs.

Mr. TURNER. Last year the Navy launched another effort to develop a replacement helicopter to support the Presidential Executive Lift mission requirements. How is the Navy acquisition strategy for the VH–92 different from the previously cancelled VH–101 program and why should Congress and the taxpayer believe the results will be different?

Admiral GROSKLAGS. The acquisition strategy for the VH–92 is fundamentally different from the previously canceled VH–71 program. The VH–71 was an extensively modified derivative of the EH–101. Changes included an entirely new power train, making the program essentially a new development effort with the inherent cost uncertainty that entails. Additionally, requirements were not clearly understood or communicated between the Navy, the prime contractor, and the principal sub-contractor, which resulted in extensive delays and cost growth. This was mainly due to not having a formal process in place to review requirements and address potential trade-offs or proposed changes.

The Navy has worked extensively to incorporate the lessons learned from the terminated VH–71 program into VH–92. Specific examples include:

- Requirements: The Navy, working in concert with the White House Military Office and the USMC, thoroughly reviewed all requirements and made appropriate trade-offs among cost, schedule and performance to ensure affordability while still meeting the requirement to provide safe and reliable transportation for the President. This process will remain in place during EMD as a mechanism to control requirement growth.
- Acquisition Strategy: Developing new technology is not part of the VH–92 acquisition strategy. Instead, a low-risk technical approach will reduce procurement costs as well as cost uncertainty. The VH–92 program will integrate mature government defined mission systems into an existing in-production helicopter. In addition, the VH–92 aircraft will retain its existing FAA certification instead of expending resources to obtain a military certification.
- Procurement Strategy: The VH–92 EMD contract is a Fixed Price Incentive type contract as compared to the Cost Plus type contract of VH–71. The VH–92 EMD contract includes "not to exceed" priced options for the production aircraft.
- Affordability: Affordability targets were incorporated into the RFP and were reflected in the offeror's proposal. Current program estimate represents a reduction of over 50% from the VH–71 program at time of termination.

In summary, the Department of Navy's VH–92 acquisition strategy emphasizes a low-risk technical approach and a focus on affordability in balance with delivering the capabilities that meet the needs of the Office of the President.

Mr. TURNER. What are some of the key impacts to the Department of the Navy planning and program execution process should the Budget Control Act of 2011 be implemented this year (or in future years)?

Admiral GROSKLAGS. A return to sequestration funding levels in Fiscal Year 2016 would require the Department to revisit the overall U.S Military Strategy as sequestration would significantly impact the Department's ability to fully implement the President's National Security Strategy. As the Chief of Naval Operations testified, a sequestered Navy of 2020 would be unable to execute two mission sets: "Deter and Defeat Aggression" and "Project Power in an Anti-Access/Area Denial" environment. Any additional reductions driven by sequestration would further exacerbate capability gaps; delay or forego the development and delivery of critical warfighting capabilities; further reduce strike weapons capability and capacity; and further reduce overall force readiness.

Mr. TURNER. Readiness of the Armed Forces has been a much talked about topic over the past few weeks. The Commandant testified just last week in front of the HASC and stated that the Marine Corps is being forced to prioritize the readiness of its deployed and next-to-deploy units to the detriment of its home station units. How has this affected Marine Corps Aviation?

General DAVIS. Marine Aviation is balancing risk in today's capacity to obtain tomorrow's capability, but we have only been able to maintain the near-term readiness of our deploying squadrons at the cost of our next-to-deploy and non-deployed squadrons. Our "bench" is barely able to meet training requirements "just in time" for deployment. Most of our squadrons do not possess the required number of aircraft, down more than 150 aircraft (20%) from our wartime inventory. Our squadrons have the right number of Marines, but not enough of them are trained due to high operational tempo and lack of aircraft.

Marine Corps operational commitments have increased while the overall numbers of Marine aircraft available for tasking and training have decreased. In 2003, at the outset of Operation Iraqi Freedom (OIF), Marine Aviation had 58 Active Component (AC) squadrons (maintaining T–2.0 readiness at an average of 1:3 deployment to dwell) and 12 Reserve Component (RC) squadrons for a total of 70. Today the Marine Corps has 55 AC and 4.5 RC squadrons, more than 10 fewer, with an average T-rating of 2.7 and many communities deploying at greater than 1:2 deployment to dwell. Marine Corps Aviation squadrons are surging in order to meet the new steady-state demand creating a ready bench that is too shallow and unable to recover. Our FA–18s and Harriers are wearing out faster than we can replace them with F–35s because of its shallow procurement ramp. We have reduced our squadron inventory of CH–53Es from 16 to 12 because we simply do not have the aircraft anymore and cannot build the CH–53K fast enough. After years of underfunding readiness accounts, we are surging our old gear to fight the nation's battles and have not been able to buy the new machines as quickly as we need to replace them. Ultimately, Marine Aviation is still able to meet all of its operational commitments, but we have reached a point of diminishing returns and readiness will track in a negative direction unless we change the way and degree to which we fund our readiness accounts.

Mr. TURNER. General, you have been one of the most vocal advocates for the F–35 program. Why do you see the F–35 as so important to the Marine Corps and where do you see it fitting into your overall aviation picture?

General DAVIS. The F–35B is the future of Marine Corps TACAIR. At IOC, scheduled for this summer, it will bring immediate capability advancement to the Marine Air Ground Task Force. The F–35's ability to see and be seen, or not be seen, as the case may be, has exceeded the Key Performance Parameters requirements. Included in the F–35's ability to see, is its ability to use its next generation radar to produce photo quality targeting images of the ground through the weather. Immediately upon IOC we can operate and support the warfighter on the ground in contested environments and our targeting capabilities will not be inhibited by bad weather. Both the stealth design and advanced radar, allowing targeting through the weather, are not capabilities of our legacy aircraft today. From IOC onward, the jet will only continue to improve, as has always been the plan. Some examples of these are: sensor fusion improvement, weapons capability improvement, pilot work load decrease, which improves situational awareness and reduces training time, a significant cost benefit to the taxpayer. The F–35 will represent a transformation for the Marine Air Ground Task Force because it provides electronic attack, disseminates battle space information over data link, the MAGTF's server in the sky, and once we reduce the threat to the point where stealth is not required, it can carry external ordinance. The F–35 becomes a 4th generation bomb truck carrying 14,000 pounds of ordnance, far more than both the Marine Corps legacy Harrier and Hornet. In essence, the F–35 is the only TACAIR platform that can transition from 5th

generation to 4th generation capabilities and then back again. I can't make a 4th generation aircraft a 5th generation one. This aircraft will replace the AV–8B Harrier, F/A–18 Hornet, and EA–6B Prowler, the entirety of the Marine Corps TACAIR legacy fleet. This will dramatically increase our capability now and give us a platform that will only continue to improve over time. It cannot be overemphasized how critical this aircraft is for our modernization and readiness efforts as we only see an increase in demand for Marines around the globe.

Mr. TURNER. The CH–53K was one program that the Commandant chose to break out in his testimony over the past several weeks. Why do you see this as a key Marine Corps Aviation program?

General DAVIS. The CH–53K is urgently needed for the modernization and readiness initiatives the Marine Corps is implementing. We have seen a sustained and unprecedented operational demand for our legacy heavy lift assault CH–53E fleet, which has prematurely aged an airframe that is on average 26.8 years old, making it ever more challenging to maintain. There are currently 149 CH–53Es in the USMC inventory, 47 aircraft short of the requirement to sustain the fleet until 2030, directly decreasing our readiness. Capable of operating from land and sea bases, the CH–53K will provide the USMC and DOD with the only heavy lift rotorcraft in the Joint Force. It will contribute directly to the increased agility and lethality of the MAGTF and Joint Force. The CH–53K will transport 27,000 pounds of external cargo out to a range of 110 nautical miles, nearly tripling the CH–53E's lift capability under high/hot environmental conditions, while fitting into the same shipboard footprint. The CH–53K will also provide unparalleled lift capability, greatly expanding the commander's operational reach. The atrophy of the CH–53E's heavy lift capability and readiness, the limited CH–53E inventory and the rising cost of CH–53E flight hours clearly underscores the importance of its replacement, the CH–53K King Stallion.

Mr. TURNER. It is well publicized that the F–18 has had numerous issues with delays in depot level maintenance. What do you see as the way forward to remedying the Marine Corps strike fighter shortfalls? How are you doing in this regard with your other Marine aviation platforms?

General DAVIS. The Marine Corps is taking a dual pronged approach to this very serious issue. It's absolutely critical that we maintain the F–35B and F–35C aircraft procurement ramp to transition the USMC TACAIR force on timeline and thereby eliminating the USMC long term strike fighter shortfall. Our next F/A–18 squadron to transition to the F–35B is VMFA–122. In addition to increase our current readiness and decrease the near term flight line gap, the Marine Corps is deeply integrated within the Naval Aviation Enterprise to increase depot throughput via hiring artisans, leveraging Original Engineering Manufacturer (OEM) maintenance and engineering, and increasing material solutions.

On this note, the Fiscal Year 2016 President's Budget request provides funding to align F/A–18 depot throughput to projected capacity and continues to fund the procurement of F–35s for the Marine Corps.

In 2014, DON leadership incorporated a multifaceted strategy to improve F/A–18 depot efficiency and throughput. The current constraints to the Hornet line are both manpower and material related. The strategy addresses these issues with an aggressive hiring and training plan for artisans and engineers, kitting of materials for the high flight hour (HFH) events based on common repair requirements, and the implementation of an enterprise-wide improvement to production flow using a theory of constraints method called critical chain project management. Additionally, the DON has collaborated with Boeing in identifying several areas to improve overall depot throughput, such as employing Boeing Engineering Support and incorporating the use of its Cecil Field facility. The strategy is proving successful as depot production levels are improving. With the requested funding, and under this plan, the Department anticipates continued improvement in depot throughput to meet annual production requirements by FY17 and full recovery by FY19.

A return to sequestration in FY16 is also a recurring concern. The Department requires a stable budget to meet these objectives. Sequestration and the compound effects of the 2013 government shutdown drove manning shortfalls for both artisans and engineers and hampered the DON's ability to respond to unplanned work found during HFH inspections. Sequestration and subsequent manpower shortfalls in turn, exacerbated the F/A–18's depot aircraft backlog.

Any further reductions in the depot maintenance, engineering and contractor support budgets below requested levels will impede the depot throughput improvement strategy. A return to sequestration would have a compounding effect that will further increase risk in our strike fighter inventory management strategy and reduce the availability of warfighting assets.

Mr. TURNER. The Marine Corps is said to be our Nation's air-ground force in readiness. What can you tell us about the overall readiness of Marine Aviation?

General DAVIS. Marine Aviation does not have the numbers of ready aircraft required for training and warfighting (106 and 158 short, respectively) or the numbers of trained and qualified personnel to fill out our structure. Of our 56.5 Active and Reserve Component Squadrons, we only have enough aircraft and qualified personnel to field 46 squadrons. We have only been able to maintain the near-term readiness of our deploying squadrons at the cost of our next-to-deploy and non-deployed squadrons. Our "bench" is barely able to meet training requirements "just in time" for deployment. We have embarked on a comprehensive readiness recovery effort in Marine Aviation. That effort, while relying on a predictable and steady recapitalization of our new aircraft, attacks the readiness problems of our legacy fleet aggressively. Our readiness shortfall, 158 combat aircraft shy of the requirement, a mix of every type, model, series we fly, can be rectified in a four year timeframe provided our readiness accounts are fully funded.

Mr. TURNER. The CNO has testified you have a strike fighter shortfall of 2–3 squadrons' worth of aircraft. Is the Navy strike fighter inventory sufficient to support operational demand?

Admiral MANAZIR. The Department of the Navy actively manages the strike fighter inventory to support operational demand. We remain challenged with end of life planning for F/A–18 aircraft that reach the end of their service life before replacement aircraft (F–35B/C) are delivered into service. Consequently, strike fighter inventory management risk increases with the Fiscal Year 2016 President's budget submission, further increasing the gap between aircraft supply and the Department's Master Aviation Plan demand.

The Department's strike fighter inventory management strategy should be viewed in two separate and distinct phases. The near-term (2015–2020) challenge is a result of reduced strike fighter aircraft procurement, higher than planned TACAIR utilization rates, and F/A–18A–D depot production falling short of the 2013 and 2014 required output. In 2014, aggressive efforts were instituted across the Department to improve depot productivity and return more aircraft back to service. As a result, aviation depots are expected to improve throughput to meet annual production requirements by FY 2017 and fully recover by FY 2019, at which time the workload will begin including F/A–18E/F service life extension efforts. In the far-term (2020–2035), strike fighter inventory management is predominantly affected by new aircraft procurement, specifically the F/A–18E/F and F–35. Far-term inventory risk will remain high as COCOM-driven operations and Fleet Response Training Plan training and readiness requirements continue to place excessive demand on the inventory, resulting in strike fighter utilization rates that exceed the projected requirement.

Mr. TURNER. The Navy has delayed procurement of 49 F–35C over the past 2 years. Is the Navy still committed to the JSF?

Admiral MANAZIR. The Navy remains fully committed to the F–35C. The aircraft is critical to the success of our future carrier air wing by providing a 5th generation strike fighter capability that includes low observable technology and data fused sensors to outpace future threats, assure access, and improve responsiveness. The program is on-track to achieve initial operating capability (IOC) as scheduled in August 2018 and recently completed a highly successful developmental test period (DT–1) aboard USS NIMITZ in November 2014, meeting all scheduled test objectives. The Fiscal Year 2016 President's budget request (PB16) enables System Design and Development (SDD), Developmental and Operational Test and Evaluation, and procures low rate initial production aircraft to support Fleet Replacement Squadron (FRS) standup. PB16 increases FY16 procurement from two to four aircraft, but accepts long-term risk in F–35C capacity due to fiscal constraints.

Mr. TURNER. We have heard the CNO testify that he has accepted risk in weapons procurement with the FY 16 budget request. Is the Navy maintaining sufficient aviation weapons to satisfy operational requirements?

Admiral MANAZIR. The Navy accepted risk in weapons procurement levels to focus efforts on the development of future capabilities at the expense of inventory capacity. Under the current constraints, the Fleet maintains a sufficient inventory to meet operational requirements, but the overall ordnance capacity contributes to increased risk in accomplishing two primary Defense Strategic Guidance missions: Deter and Defeat Aggression and Project Power Despite Anti-Access/Area Denial (A2/AD) Challenges. Furthermore, the decision assumes risk in training weapons inventory capacity to satisfy operational requirements.

Mr. TURNER. We have noted that the Navy plans to recapitalize the carrier onboard delivery (COD) mission with a variant of the V–22. What was the rationale behind this decision?

Admiral MANAZIR. The 35 remaining C–2A aircraft are nearing the end of their service life and becoming increasingly more expensive to operate. Accordingly, the Navy identified the need for a solution to the future Carrier Onboard Delivery (COD) mission capability.

Between 2004 and 2013, the Navy performed a series of analyses that identified the COD capability as a critical force enabler requiring a material solution. They concluded that a manned carrier-based logistics aircraft was the preferred material concept, and that "off-the-shelf" solutions were available. The analyses also found that a force structure of 44 C–2 or V–22 class aircraft is required to conduct the COD mission into the future. Additionally, the latest analysis determined that a COD mission solution is required no later than 2026.

In 2012, an update to the 2005 Analysis of Alternatives (AoA) focused on the cost estimates for the six most likely alternatives. The analysis concluded in part that transferring the COD mission to the V–22 as part of the existing Program of Record was a viable and cost-effective option that provided the Navy the "best value" solution. This funding was validated by the Office of the Secretary of Defense, Cost Assessment and Program Evaluation (OSD CAPE) in December 2012. Following validation, an underway Military Utility Assessment (MUA) was performed in June 2013 onboard the USS HARRY S. TRUMAN (CVN 75). This assessment demonstrated that the V–22 is an effective, flexible and safe platform to conduct the COD mission from an aircraft carrier.

Based on in-depth analysis and demonstrated capability, the Department of the Navy selected a variant of the V–22 as the solution to recapitalize the COD mission aircraft. This decision includes an acquisition strategy which funds the existing V–22 Program of Record to procure 44 COD mission aircraft. This approach takes advantage of an existing full-rate production line, captures potential multiyear procurement savings and capitalizes on the benefits of operating a common joint-service aircraft. Overall, this decision is the most affordable solution with the least risk to meeting Navy requirements.

Mr. TURNER. Does the Navy have enough EA–18G aircraft to satisfy Navy and Joint requirements?

Admiral MANAZIR. The Navy has the inventory of EA–18G aircraft we need to support current Navy Airborne Electronic Attack (AEA) mission requirements.

There is a study in progress to identify Joint warfighting requirements, Concept of Employment (CONEMPS) and future mission sets. The results of this study are expected to be released this summer and will provide insight that will allow the Department to determine the necessary force structure to meet all DOD requirements for Airborne Electronic Attack rather than just those requirements unique to the Navy.

Mr. TURNER. Is the Air Force considering a philosophical shift toward a joint acquisition approach to procuring "capabilities-based platforms" instead of "platform-based capabilities"?

General RAY. Yes, the Air Force is exploring a more "capabilities-based" development planning process that includes multiple mission areas and functional domains vice a specific core function. As the AF leadership has stated, we can no longer afford to develop weapon systems based on traditional linear acquisition processes. Instead, we will focus first on developing strategic, enterprise-wide Air Force capabilities before establishing formal programs. Conducting strong and effective cross-core function, multi-domain development planning gives the best opportunity to leverage emerging technologies.

To that end, the AF has chartered an Enterprise Capability Collaboration Team (ECCT) to deliver a capability development plan for our future Air Superiority capability needs—a plan that prescribes an agile and adaptive way forward to solve our toughest enterprise-wide challenges. This is intended not to be another bureaucratic "process improvement" or re-organization effort but is expected to focus and consolidate the AF's current efforts and processes to develop game-changing technologies that deliver enterprise-wide effects. While these improved processes have a joint foundation and include joint threat assessments in the planning, they are not always intended to produce a joint solution—one design/derivative solution for multiple services.

The AF is starting with Air Superiority 2030 as our first endeavor however the AF leadership plans to apply this approach to other AF strategic challenges to ensure we are agile and adaptive and maintain our status as the World's most capable Air Force.

Mr. TURNER. Do you have any concerns about the aerospace industrial base in the United States in regards to them being able to meet our current and future national security requirements?

General RAY. Since the great industrial mobilization for World War II, the nation has benefitted from a robust industrial base supported by sustained public and private investments. Today's aerospace industrial base underpins the Air Force's ability to provide Global Vigilance, Global Reach, and Global Power for the nation and our allies. The Air Force and the nation have been fortunate in that many advances in civil and military aerospace technologies are mutually beneficial. For example, advances in turbine engine technology enable commercial aircraft to fly longer routes while these same advances extend the combat radius of tactical aircraft. There are similar examples in other areas such as electronics, metallurgy, and composite materials. The result of the sustained pattern of public and private investment is a robust aerospace industrial base, with a favorable trade balance of over $60 billion, fully capable of meeting current national security requirements.

Looking ahead, there are areas for concern. While today's Air Force is the smallest and oldest in our history; it is fully committed around the globe. As the Air Force has become smaller over time, our demands on the industrial base have lessened. In response, industrial capacity has fallen, potentially leading to the loss of industrial capability. Quite simply, no company can afford to keep empty facilities or a workforce with no work to do. Our ability to make informed judgments over the potential ability of the aerospace industrial base to support future national security requirements is clouded by fiscal uncertainties, resulting in part from the Budget Control Act.

While the Air Force and the Department of Defense can lessen the risk through programs such as Aviation Innovation Initiative and the Adaptive Engine Technology Development effort, these do not fully address the national commitment required to sustain this nation's role as the global technical leader in military aerospace.

Mr. TURNER. Do you have any concerns about the intellectual pool of scientists and researchers that make the United States their home, and have historically contributed so much to our national defense?

General RAY. Yes, the Air Force is concerned about recruiting and retaining scientists, researchers and engineers. The domestic scientist and engineering workforce has been sustained by research, development, test, and engineering (RDT&E) funding from the government, private industry, and academia. This pool of skilled workers have historically contributed to our National Defense through in-house efforts as well as the "spin-in" of commercial technology and talents into military applications and the "spin-out" of military technology and personnel into the commercial sector. Retaining and refreshing the science and engineering workforce has enabled the military to maintain its technological edge and sustain an intellectual and industrial base to innovate, design, field, and maintain systems for the warfighter. Uncertain federal budgets coupled with alternatives to traditional employment present many challenges for recruiting and refreshing the Air Force science and engineering workforce. Internet, social media, and other new industries with limited or no application to military applications are attracting S&E graduates. Both industry and government continue to have challenges attracting and retaining experienced scientists and engineers. The Air Force addresses these challenges by conducting science, technology, engineering and mathematics (STEM) outreach around Air Force base communities. The Air Force conducts over 150 STEM outreach events per year, leveraging local, state and federal organizations to reach over 100,000 students and teachers. The Air Force has successfully leveraged the Science, Mathematics and Research for Transformation scholarship for service program to build its STEM workforce across the Air Force. In addition, the Air Force research community actively engages academia in numerous research partnerships to tackle Air Force priorities; to include providing grants to applicants for higher education in vital research domains through the National Defense Science and Engineering Graduate Fellowship program. Furthermore, the Air Force has codified its STEM workforce goals in Bright Horizons 2.0, the Air Force STEM Workforce Strategy. Bright Horizons 2.0 outlines strategic goals to institutionalize STEM workforce planning and force management to build and maintain a highly competent, diversified and agile workforce.

Mr. TURNER. We understand that just this past week that the Air Force has released requirements for a replacement to the T–38 pilot training aircraft, called the T–X. There is a bow-wave of acquisition costs that seem to be piling up at once. How is the Air Force going to control costs and execute a successful T–X acquisition program among others and avoid a repeat of previous programs where the Air Force was overly optimistic concerning cost, schedule, and performance?

General RAY. T–X is at the forefront of implementing the acquisition improvements known as Better Buying Power, Strategic Agility, and Bending the Cost Curve. These initiatives will ensure the Air Force gets the best value system solu-

tion while replacing its aging fleet of T–38 aircraft and associated Ground Based Training Systems (GBTS). From program inception, the Air Force has actively communicated with industry to identify TX system requirements utilizing mature technology to provide a realistic training experience for the pilots of 4th and 5th generation fighter aircraft. The combination of training system maturity, early requirement definition, and the number and variety of offerings expected will help maximize competition and reduce government cost. Applying the principles of Strategic Agility during the acquisition will ensure the Air Force retains the flexibility to upgrade training systems technology as pilot training requirements evolve over the life of the system.

Mr. TURNER. If the Air Force had the money, would it retain A–10s in the inventory? If Congress provides funds for retaining the A–10, what are the advantages of retaining A–10s in the Air Force inventory from a capability and capacity perspective?

General HOLMES. If Congress provided additional funds above the FY2016 President's Budget request, the Air Force would use these funds to address higher priority challenges including fighter force recapitalization and modernization required to meet the demands of new, more capable threats, along with weapons capacity and readiness shortfalls that would enable us to implement the Defense Strategic Guidance at lower risk. Retaining the A–10 fleet would provide some operational tempo relief to other close air support-capable aircraft in our inventory. However, continuing to operate and maintain the A–10 fleet limits our ability to address existing capability and readiness challenges.

Mr. TURNER. We understand that the Commander of First Air Force has submitted an urgent operational need, or UON, for new radars on the F–16 fleet that conducts the aerospace control alert mission, and that this UON is now being evaluated by the Joint Staff. Does the Air Force have a plan to upgrade radars for the aerospace control alert F–16 aircraft?

General HOLMES. Yes, the Air Force is working with the Joint Staff to get a fully approved Joint Urgent Operational Need for F–16 Active Electronically Scanned Array (AESA) radars for a portion of our fleet. The initial fielding will focus on units protecting the National Capital region; additionally, the Air Force is exploring options to expand the AESA deployment to other units performing the aerospace control alert mission.

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