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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2013
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED TWELFTH CONGRESS
SECOND SESSION
—
SUBCOMMITTEE ON TACTICAL AIR
AND LAND FORCES HEARING
ON
**FISCAL YEAR 2013 DOD ROTORCRAFT
MODERNIZATION PROGRAMS**
—

HEARING HELD
MARCH 27, 2012



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FISCAL YEAR 2013 DOD ROTORCRAFT MODERNIZATION PROGRAMS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Tuesday, March 27, 2012.

The subcommittee met, pursuant to call, at 3:02 p.m. in room 2118, Rayburn House Office Building, Hon. Roscoe G. Bartlett (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. ROSCOE G. BARTLETT, A REPRESENTATIVE FROM MARYLAND, CHAIRMAN, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. BARTLETT. The subcommittee will come to order. Good afternoon. Thank you all for joining us. I would like to welcome our witnesses, Lieutenant General Terry Robling, Deputy Commandant for Aviation U.S. Marine Corps; Rear Admiral William Moran, Director, Air Warfare Division, U.S. Navy; Mr. Richard Gilpin, Deputy Assistant Secretary of the Navy, Air Programs Office; Major General William Crosby, Program Executive Officer Aviation, U.S. Army; Major General Noel Jones, Director, Operational Capability Requirements, U.S. Air Force; and Major General Robert Kane, Director, Global Reach Programs, U.S. Air Force.

Thank you all for being here and for your service to our Nation.

The use of helicopters has dramatically changed warfare doctrine from the time of their introduction during the Korean War, followed by development prior to Vietnam, use during Vietnam as a mobility platform and current rotorcraft aviation operations. The helicopter is now a platform of maneuver used for multimissions, to include resupply, medical evaluation, reconnaissance, air assault, and attack operations.

The U.S. Armed Forces currently have approximately 7,000 helicopters. Operations in Iraq and Afghanistan have put an even greater reliance on rotorcraft support as a result of improvised explosive devices, which have restricted ground movement. Based on current planned force structure reductions, the demand for rotorcraft capability will even be more critical in the future. Maintaining a healthy fleet of rotorcraft equates to the total force having the ability to cover the wide area battle space as referenced in the national security strategy.

The purpose of this hearing is to get an update from each Service as to the condition of their respective current rotorcraft fleet and plans for future upgrades and modernization. In addition to various platform updates, the committee hopes to learn how the Services are utilizing research and development dollars to develop the next

generation of rotary wing systems and subsystems. And finally, given the likelihood that there will be a continued or even greater dependence on rotorcraft in the future and the likelihood that rotorcraft will have to operate in greater threat environments than they currently do in Afghanistan, the committee expects to learn what each Service is doing in regard to aircraft survivability equipment and how they are working together to maximize resources.

Again, I thank all of you for your service to our country and for being here. I look forward to your testimony.

And now to my good friend from Texas, the ranking member, Mr. Reyes.

[The prepared statement of Mr. Bartlett can be found in the Appendix on page 29.]

STATEMENT OF HON. SILVESTRE REYES, A REPRESENTATIVE FROM TEXAS, RANKING MEMBER, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. REYES. Thank you, Mr. Chairman.

And let me add my welcome to all of you. Thanks for being here and thanks for your service.

Today's hearing on DOD [Department Of Defense] rotorcraft programs is the first Tactical Air Land Forces hearing specifically covering these programs, I believe, in many years, and based on the budget request for fiscal year 2013, a hearing is definitely warranted for several reasons.

One major issue is the cost of these rotorcraft programs and how they impact other areas of military service budgets. The Army 2013 request, for example, includes \$4.3 billion for procurement of upgraded and new rotorcraft, including Black Hawk, Chinook, Apache, Kiowa, and Lakota helicopters.

By comparison, the Army's request for weapons and tracked combat vehicles in 2013 is only \$1.5 billion, less than half as much.

The Marine Corps' request for rotorcraft programs totals \$1.4 billion for just two major programs, the new AH-1Z and the UH-1Y helicopters and CH-53K development programs. If one adds the V-22 program to that amount, the total for the Marine Corps' request is more than \$3 billion. This \$3 billion total exceeds the Marine Corps' entire ground equipment procurement budget, which is about \$2.5 billion.

The many—the other two Services have somewhat lower requests, with the Navy's request at \$1.2 billion and the Air Force coming in somewhere around \$500 million. If one totals up the Service requests for rotorcraft programs, you get around \$9 billion, with the vast majority of that funding being procurement of new or upgraded aircraft.

So it is clear that rotorcraft programs are a priority for all the Services and, in particular, of course, the Army and the Marine Corps. Overall, this strong investment in updating and replacing the services of rotorcraft fleets, I think, is a very good thing.

However, one concern that I also have is how skewed this funding request may be in favor of production of new manned rotorcraft as opposed to research and development of new rotorcraft for future use. This imbalance is in part the result of termination of almost every new manned rotorcraft program DOD has tried to start

in recent years. As an example, the Army has little funding for R&D [Research and Development] of new rotorcraft after the termination of the Comanche and Armed Reconnaissance Helicopter programs. The program intended to follow those two efforts remains mired in seemingly endless analysis of alternatives with, from our perspective, no clear path forward.

Likewise, the Air Force cancelled the CSAR-X combat rescue helicopter program in 2009, and this year cancelled its program to replace the aging U-1 Huey helicopters. Both have yet to restart.

The Navy continues to struggle with defining requirements for the new Presidential helicopter almost 3 years after termination of the VH-71 program, again in 2009. Only the Marine Corps has a large-scale and so far successful R&D program underway with the CH-53K heavy lift helicopter program.

Another concern that I have is the lack of commonality in some mission areas between our respective Services. The Army, Navy, and Air Force all fly variants of the UH-60 helicopter, which produces significant savings in both production and support costs. The Marine Corps, in contrast, is fielding rotorcraft unique in DOD, including the upgraded AH-1Z Cobra and the UH-1Y Huey and, of course, the CH-53E Super Stallion. This does not mean that the Marine Corps programs should be stopped or reduced, but I do believe that it does raise the issue of how in the future, at least for the next generation of rotorcraft, DOD can better achieve truly joint solutions.

Finally, with respect to the unmanned rotorcraft, there are several promising research and development efforts underway, with the Navy and Marine Corps leading the way with the MQ-8 and the Cargo Resupply Unmanned Aerial System. While funding for these efforts is relatively small at this point compared to our manned rotorcraft programs, they could be important waypoints toward future efforts.

So, with that, Mr. Chairman, I look forward to the testimony from our guests, and I yield back the balance of my time.

[The prepared statement of Mr. Reyes can be found in the Appendix on page 31.]

Mr. BARTLETT. Thank you.

Without objection, all witnesses' prepared statements will be included in the hearing record. It is my understanding that there will be three oral statements, one representing the Navy and Marine Corps; second, the Army; and third, the Air Force. The first testimony is from General Robling, representing the Navy and Marine Corps.

STATEMENT OF LTGEN TERRY G. ROBLING, USMC, DEPUTY COMMANDANT FOR AVIATION, U.S. MARINE CORPS; RADM WILLIAM F. MORAN, USN, DIRECTOR, AIR WARFARE DIVISION, U.S. NAVY; AND RICHARD GILPIN, DEPUTY ASSISTANT SECRETARY OF THE NAVY AIR PROGRAMS OFFICE

General ROBLING. Chairman Bartlett and Ranking Member Reyes, distinguished members of the subcommittee, it is our honor to appear before you today to discuss the Department of the Navy's rotorcraft modernization programs.

Testifying with me today are Mr. Rich Gilpin, Deputy Assistant Secretary of the Navy for Air Programs, and Rear Admiral William Moran, the Navy's Director of Air Warfare.

And as you stated, Mr. Chairman, I will keep our oral remarks brief, and I will submit our combined statement for the record, including the questions requested by the subcommittee.

I would like to begin by thanking the members of the subcommittee for your support of our programs and our marines and sailors. Eleven years into sustained combat operations, we continue to see marines and sailors perform magnificently. They could not perform their missions without the tools of their craft. The vertical lift capability of the Department's rotorcraft platforms is one of the key enablers in combat.

Last year we embraced our past history, as Naval aviation celebrated its centennial. This year, Marine Corps aviation is doing the same. It was nearly 66 years ago, in 1946, when Major Armand Delalio was designated as the first Marine helicopter pilot. Our workhorse of the fleet, the CH-53, flew its first flight in October of 1964. The CH-53 Delta has recently flown its last flight on U.S. soil, but it continues to provide expeditionary heavy lift, as it has since its beginning in combat. This final deployment will retire those aircraft in place in Afghanistan later this summer.

While the requirement to accomplish our missions have not abated, we recognize that today our Nation faces immense challenges. The budget reductions necessitated by the Budget Control Act remind us of the unquestioned need to be good stewards of our resources and to be prudent in our spending. We continue to actively manage our current rotary craft inventory. The MV-22 cost per flight hour decreased 13 percent in fiscal year 2011, and the program received the prestigious David Packard Excellence in Acquisition Award, which recognized exemplary performance and innovation acquiring and delivering products and capabilities to the warfighter.

We will begin our AH-1 Zulu build new procurement strategy in fiscal year 2013, which eliminates the AH-1W remanufacture process and enables a faster recovery from the USMC's current attack helicopter shortfall. The VH-3 Delta and the VH-60 November continue to provide seamless vertical lift for the President and the Vice President of the United States, while the Presidential helicopter replacement aircraft effort focuses on completing the update to the analysis of alternatives and continues to develop an acquisition strategy that targets affordability, cost control, and reduction of risk prior to the awarding of any major contracts.

We must persist in modernizing and recapitalizing our Naval aviation forces by the most affordable means possible. With your assistance, we are leveraging our buying power with successful multiyear procurements on the V-22 and H-60, achieving substantial procurement cost savings. The H-1 upgrades program has seen aircraft delivered ahead of the contracted schedule and on budget. We have increased our lethality with such low-cost weapons as the Advanced Precision Kill Weapon System II.

Upgrades to the MH-60 Romeo and MH-60 Sierra have significantly improved the antisubmarine warfare and surface warfare capabilities of the fleet. Still in development is the CH-53K, which

will have nearly triple the lift capability of the current CH-53 Echo. The CH-53K program was recently awarded the Robert L. Pinckney Award from the American Helicopter Society International. This award is given in recognition of notable achievement in manufacturing research and development of rotorcraft or rotorcraft components.

Finally, the Department of the Navy is looking toward the future, and we are actively participating with the other Services in the DOD-led future vertical lift initiative. I would like to thank you once again for the opportunity to speak here today, and we welcome your questions on the Department of the Navy's rotorcraft modernization programs.

[The joint prepared statement of General Robling, Admiral Moran, and Mr. Gilpin can be found in the Appendix on page 33.]

Mr. BARTLETT. Thank you.

Now General Crosby from the Army.

**STATEMENT OF MG WILLIAM T. CROSBY, USA, PEO AVIATION
HEADQUARTERS, U.S. ARMY**

General CROSBY. Good afternoon, sir.

Chairman Bartlett, Ranking Member Reyes, and distinguished members of the subcommittee, thank you for calling this hearing.

I am pleased to be here today to discuss Army aviation and welcome this opportunity to testify before you. On behalf of our great Army, I appreciate the tremendous and ongoing support this committee has provided to our soldiers stationed around the world. I know you all will be able to agree that our soldiers have performed magnificently and their families have sacrificed much for our Nation over this past 10 years.

You specifically asked that the Army address several concerns on the Army aviation modernization. Army aviation is, without a doubt, the best in the world, employing cutting-edge technology that provides an invaluable capability, making it indispensable on the battlefield. This capability is only as good as the aviation soldiers who operate and maintain these great systems worldwide.

Our relationship with the ground force is the best that it has ever been in Army aviation's history. Achieving such a high level of professional excellence took years of hard work by a new generation of air and ground warriors, who fully respect the warfighting accomplishments of each other. It is our dedication to supporting the ground commander that helped establish a collaborative environment among the various members of the aviation enterprise over the past several years and will serve as the foundation for our future success.

The Army recognizes that in our current fiscal environment, we must share in the responsibility of finding new and innovative ways of acquiring and sustaining our Army aviation weapons systems, smarter, faster, cheaper, and more effectively. As such, we have taken a proactive approach to aviation modernization plan that ensures the balanced long-range approach. We recognize that we must adapt our plan while avoiding the natural tendency to cut our investment programs to meet short-term mandates. Our plan accepts risk in some modification improvements, minimizes the impacts to our industrial base by preserving our multiyear contracts

and increases the production plan by 3 to 5 years in the long term, which means we would reduce quantities in the near term.

We have done this to preserve our science and technology investments in a future vertical lift, maintain our path to address the deficiencies in the Scout mission area, and continue our procurement and modernization of our current platforms and our unmanned aircraft systems.

My written testimony outlines in more detail our plan in maintaining and sustaining Army aviation and modernization plans and addresses your specific concerns. With the current resource environment, we are going to have to take the best solution we can with the best potential for success without compromising safety, identity—excuse me, identify what those impacts are early, and determine the best course of action to give our soldiers what they need at a price that we can afford.

As our Army cares for its aging fleet, we will continue to support the development and execution of a new investment strategy that will provide for new platforms ready to field in the 2025 timeframe and beyond. The joint future vertical lift aircraft is an integral part of our long-range plan, and part of our balanced approach to maintain our investments; 2030 is the aim point for a new system to replace our aging fleets, and our initial effort will be focused on the attack and utility mission areas, which comprises about 75 percent of our current fleet.

Science and technology investments today in subsystems like the improved turbine engine program and the other identified and enabling technologies are critical to maintain our planned schedule. In continuing to modernize our fleet, our investments have produced a healthy inventory of aircraft that are still high in demand in Afghanistan, Iraq, and other places in the world where our soldiers have answered our Nation's call. We will need a faster and more survivable aircraft after 2030 to remain effective.

Additionally, we continue to execute our multiyear contracts, which have gained our taxpayers significant savings over the prices that would have result in the Army-awarded single-year contracts.

Army aviation programs and their foundations are solid, and we have a modernization strategy for the future. Our aircraft and equipment are the best America can provide and that have displayed readiness in flying hour OPTEMPO [Operations Tempo] rates that far surpassed expectations.

More importantly, we have answered the calls to integrate our capabilities with various combined arms teams, sustaining forces and joint agencies.

The fiscal year 2013 President's budget is supportive and representative of Army aviation priorities. While we desire to field our modernized aircraft as quickly as possible, a balance among other Army priorities has been accomplished in this fiscal year 2013 budget request. Your committee has been very supportive of Army aviation budget requests in the past. I am confident you will conclude the Army has optimized an aviation modernization, given the fiscal realities within the Army's top line budget.

Again, the credit for Army aviation's success and continued support from senior leaders belongs to the soldiers on the ground who will always be our utmost priority. Whatever we do, we cannot

allow our tremendous relationship in supporting the ground force commander to degrade. It is this strong relationship that will be the lens by which we look towards the future and the benchmark by which we will measure success. As we move ahead, Army aviation will continue to ensure we reduce the burden on the soldier.

The next several years will be pivotal for Army aviation. The resources provided to the Army to conduct aviation operations while modernizing for the next generation of aviation capabilities will determine the Army's ability to continue to accomplish its mission and be postured to meet future commitments. To execute these plans, we need your continued leadership and support and provide full, timely, and sustained funding so we will be ready for current and future challenges. I am ready to address any questions you may have, sir. Thank you.

[The prepared statement of General Crosby can be found in the Appendix on page 46.]

Mr. BARTLETT. Thank you.

And finally, we have General Kane from the Air Force.

STATEMENT OF MAJ GEN ROBERT C. KANE, USAF, DIRECTOR, GLOBAL REACH PROGRAMS, U.S. AIR FORCE; AND MAJ GEN NOEL T. JONES, USAF, DIRECTOR, OPERATIONAL CAPABILITY REQUIREMENTS, U.S. AIR FORCE

General KANE. Chairman Bartlett, Ranking Member Reyes, and distinguished members of the subcommittee, thank you for the opportunity to update you on key Air Force rotorcraft acquisition programs and modernization efforts. I would like to briefly highlight our special operations, personnel recovery, nuclear security, and continuity of Government missions and platforms.

U.S. Special Operations Command uses the CV-22 Osprey to provide long-range insertion, extraction, and resupply of Special Operations Forces in hostile, denied, or politically sensitive airspace. In order to successfully meet its CV-22 taskings, the Air Force continues to fully support the program of record of 50 aircraft. The current CV-22 fleet stands at 23 aircraft, with the final buy of 7 aircraft scheduled in fiscal years 2013 and 2014. Declaration of full operational capability will be made following the delivery of the last CV-22 in fiscal year 2016.

Under the current fiscal constraints, it is important to note that the CV-22's capabilities, reliability, and availability are increasing, while operating costs are decreasing. Future modifications and improvements to the CV-22 will make the aircraft even more effective, reliable, and cost-efficient. For example, we have begun CV-22 Block 20 baseline production as well as retrofit modifications to improve operational safety and effectiveness. Notably, these enhancements will improve line-of-sight and beyond-line-of-sight communication systems to rein in crew situational awareness capabilities and defensive systems.

In terms of current operations and sustainment, our five deployed CV-22s executed 635 sorties and 1391 hours between May of 2011 and January 2012 with an almost 75 percent mission capable rate. This includes some recent engine time-on-wing improvements that have increased time between engine removals by 173

percent. Beyond improved capability, this translates into an estimated \$16 million in savings per year.

Additionally, the Joint Program Office is investigating modifications to the engine inlet geometry, engine blade coatings, and the high-power turbine case design to further improve engine time on wing. While the CV-22 aircraft procurement phase nears completion, we are moving to address HH-60G fleet availability issues. Our HH-60G combat search and rescue platform is a low-density, high-demand asset. During the past 10 years, our heroic crews have rescued over 12,000 military and civilian personnel. This past year, HH-60G crews performed 16 combat search-and-rescue missions and 2,100, over 2,100 casualty evacuation missions.

This high demand has taken a toll. Only 99 of the original 112 aircraft still exist. Of those 99, only 93 are currently flyable. Major structural cracks have been found on 66 of the 99 aircraft, with 49 sustaining battle damage in the last 2 years. Aircraft availability is approximately 60 percent and expected to decrease to 50 percent by 2015 due to continued component obsolescence and structural issues.

The Air Force is taking a three-step approach to address this shortfall. First, we are modifying the existing HH-60G helicopters to keep them viable until the Air Force can fully recapitalize the fleet. Second, the Air Force has implemented the operational loss replacement program to return the HH-60G fleet to numbers capable of meeting our operational requirements. This is only a temporary bridge to a final solution, which is to replace the entire fleet.

To this end, the Air Force released a draft request for proposal for a full and open competition on 16 March of this year, with the final RFP planned for release in May. Contract award is planned for spring of 2013, with initial operational capability in 2018. With these combined efforts, the Air Force will be able to maintain its commitment to personnel recovery, a moral imperative for supporting our men and women on the front lines.

The Air Force also has two other critical vertical lift missions, National Capital Region support and nuclear security. The current UH-1N fleet, which entered the Air Force in 1970, cannot fully meet the requirements of these missions, lacking sufficient range, speed, payload, endurance, survivability, and number of aircraft. The 2013 President's budget terminated the common vertical lift support platform program, which was intended to replace the UH-1N fleet.

Until a long-term replacement is possible, the Air Force will consider other strategies to mitigate aircraft safety and capability gaps. In the near term, we are evaluating safety and capability improvements, specifically the installation of crashworthy seats and night-vision-compatible cockpits.

In addition to these modifications, we are considering upgrades to training systems that would lower training costs, decrease the UH-1N flying hour requirement and extend, and hopefully extend the useful life of these airframes.

Finally, the Air Force is pursuing the transfer and appropriate modifications of up to 22 UH-1Ns from the Marine Corps while we develop a long-term solution.

Thank you for the opportunity to address the subcommittee. I appreciate your strong support for the Air Force and our rotorcraft programs, and I look forward to answering your questions.

[The joint prepared statement of General Kane and General Jones can be found in the Appendix on page 62.]

Mr. BARTLETT. Thank you all very much for your service and your testimony. As is my practice, I will reserve my questions until last.

Mr. Reyes.

Mr. REYES. Thank you, Mr. Chairman.

And thank you, gentlemen, for your testimony.

And, you know, having had the opportunity to be at the initial stages of the rotorcraft, the helicopter being used in combat in Vietnam, this is an area that I am very much personally interested in, and so it is hard for me, based on what we are understanding from the committee, to see that to one degree or another, the Services seem to lack a clear understanding or idea of what they want for the next generation of rotorcraft. As a result, there have been numerous delays in the getting new rotorcraft R&D programs on track with, I am being told, the last five major service programs being terminated. Those were the Comanche, the VH-71, the ARH [Armed Reconnaissance Helicopter], the CSAR-X [Combat Search and Rescue], and the CVLSP [Common Vertical Lift Support Platform].

So the questions I have regarding this are why have we seen so many failures in the new rotorcraft R&D efforts? What is each of the Services doing to better define what they will need or what they will want, what kind of capabilities you will want for future operations? And what specific R&D investments are each of you prepared to make in order to better understand the rotorcraft technology of the future? So if any or all of you are willing to take a shot at that, I would appreciate it.

General ROBLING. Sir, I will take the first shot at that. So thanks for that question.

I think, you know, the Marine Corps, we are into our future vertical lift programs right now. We are into them, and we started 10 to 12 years ago starting to downsize the Marine Corps' type model series, both fixed wing and helicopter, into, you know, six or seven type model series. We are flying aircraft right now, the CH-46, the H-3, that are over 40 years old, in some cases, still flying, over 40. So we buy those on a 20-year or 30-year program, and we have stretched them to 40 years, and in some cases, the, you know, CH-46 is at 80 percent readiness levels. Right now, our CH-53 is, in 2014, will be, the Echo will be 30 years old. Some of those aircraft will fly another 10 years. We will require that to do that until we get the 53K online.

So you are asking me about our future vertical lift, that is our future vertical lift, heavy vertical lift, is the CH-53K that we expect once we get IOCed [Initial Operational Capability] and get their full eight squadrons, that we will probably be flying that aircraft another 40 years. We have taken the UH-1 November, which very old aircraft in the Whiskey, and bought the or looking to procure the Yankee and Zulu. The UH-1 November, when I went to OIF-1 [Operation Iraqi Freedom] with General Amos as the wing

commander and I was his assistant and then Major General Mattis was his First Division Commander, when General Mattis wanted a route recon aircraft to route recon his area, I couldn't put him in a UH-1 aircraft. If I put two marines in the back with 50 cal machine guns, I didn't even have enough room for an ice chest or cold drinks, and so we had to stick him in a CH-46. You can imagine that made him pretty happy.

So we are getting to the end of the life of those aircraft, and the moneys that we put into both R&D, in this case the H-1, this year, \$31 million in R&D to upgrade those aircraft and continue to buy them and, as you pointed out, \$824 million to buy at least the 15 Yankees and the 13 Zulus that we are going to buy in this FYDP [Future Years Defense Program]. And of course, we do have \$606 million across the FYDP in R&D for the CH-53K, which we are hoping to IOC in fiscal year 2019. So while we are looking forward, I think the Marine Corps is in its future vertical lift right now. We are participating in OSD's [Office of the Secretary of Defense] future vertical lift program. We are putting money toward that with the rest of the Services as we look ahead to aircraft that are coming off the shelf that may provide, you know, technologies that provide us faster aircraft, always looking to go faster, carry more people with less cost and those kind of things, and so I think the answer to that, at least for the Marine Corps, is we are involved.

Mr. REYES. The 46 is a Sea Knight, right?

General ROBLING. That is correct, sir.

Mr. REYES. When I got to Vietnam in March of 1967, the Marines were flying CH-34s, the big radial engine lumbering. So that is why we are very much interested in making sure we have these programs that will advance our capabilities into—and turn R&D programs into rotorcraft that would provide the needs of, you know, future marines, sailors, Army, and Air Force. Anybody else want to comment on that?

Mr. GILPIN. Yes, sir. I wanted to thank you for your question relative to Presidential helicopter; I wanted to give you a sense of where we are going with that. You were right when you mentioned that getting clarity on requirements is probably critical to what we need to do and probably one of the shortcomings we faced as we face the challenge on the VH-71 program. So we are taking some time to make sure we get the requirements well understood, well coordinated between what is required for the marines that operate those helicopters as well as our customer, the White House in this case, and working very hard to do that.

Our analysis of alternatives is nearly complete. In the meantime, we are sustaining the current fleet of helicopters, making some improvements to those, updated communication suite, updated vulnerability improvements and the like, and those technologies will be used to, as a starting point when we go into the VXX [Presidential Helicopter Replacement Program] program.

So we are developing an acquisition strategy, taking advantage of leveraging that new technology and to developing the future helicopter, and we should have a solution that is quicker to service and at an affordable price.

General CROSBY. Sir, I would like to pile on to that if I could.

During your time in Vietnam, we were flying—the same CH-47s that you saw there; we are still flying them today. So they have been upgraded a little bit, thanks to you all's help, but we are still flying them.

We are looking at this in kind of a balanced approach. You know, the normal tendency in a constrained environment is to cut your investments, and I think your comments have shown or reemphasized to us what we already believe, that you have got to look at it as a balanced approach because if you cut off your investments 10 years down the road, we have no new program.

So we are looking to, if you will, sustain what we have currently today to modernize, which is more of a challenge today than in the past because technology is turning over so fast, and then the third one is to put those S&T [Science and Technology] dollars towards developing that long-range plan.

My Marine Corps brothers mentioned the future vertical lift. There is a study that has been done; I know you all are anxiously awaiting the release of that. Our Vice Chairman of the Joint Chiefs has it on his desk now. Then it will go to the DEPSECDEF [Deputy Secretary of Defense] for approval and then released to you.

It lays out a road map for all of us, the Services together looking forward, and it identifies kind of a scalable architecture of rotary wing or future vertical lift platforms, a reconnaissance or a light; a medium, which is attack utility; a third is kind of a cargo heavy lift; and then the fourth would be an ultra, so a scalable, where you can have similar technologies across the power to train in those systems. The one that we have elected to go after first for the best return on our investment—we are the biggest parade on rotary wing in the Army, but 75 percent of my fleet is in the attack utility variant. So what that means is, in a limited budget environment, that means we are going to have to take some risk in some other areas in our portfolio. So when I mention sustainment and I mention upgrades, we are going to have to focus on balancing those; the Scout area is one where we can accept some risk, and I expect to get another question on that here in a little bit. But we will accept some risk in those areas to focus on that long-range investment to get a medium-lift variant. And, you know, the medium lift is a utility which we buy all across here is all common in the Black Hawk or the variants of it for the Services.

So we see that as the next generation, and all my brothers to my right and left are participating in that. So we see a lot of potential for a joint variant coming out of that effort.

General KANE. Thank you, Congressman Reyes, for the question.

We agree with General Crosby in his assessment of the future vertical lift efforts and our participation in that, but currently, the Air Force is pursuing, for the most part, off-the-shelf technologies. And R&D efforts are primarily aimed at integrating, again, commercial or not commercial off-the-shelf but currently available off-the-shelf systems into the combat rescue helicopter, and that would have been the same in the case of the CVLSP that was cancelled this year.

Our R&D, this effort, then, in developing off-the-shelf capabilities and the integration will take us through the capabilities gaps into

the 2030 timeframe, which brings us into that timeframe of the future vertical lift strategy.

The Air Force is investing in several, in particular, degraded visual environment technology solutions, and we are leading the way in 3D landing zone technology development. One of the points I would have to make is that we only have 5 percent of the rotary wing fleet in the Air Force, and as such, our contributions to that R&D effort are not quite as great as the other Services. And we definitely capitalize on the efforts of our brothers down the table.

Thank you, sir.

Mr. REYES. Thank you all.

Thank you, Mr. Chairman.

Mr. BARTLETT. Mr. LoBiondo.

Mr. LOBIONDO. Thank you, Mr. Chairman.

I thank the panel for being here today. I would like to talk first about the common vertical lift support platform.

And I guess General Kane, the fiscal year DOD budget included \$52.8 million in funding for this program and proposed no money in fiscal year 2013. We now understand that the common vertical lift support platform will not go forward. And the Air Force has, instead, decided to take used Marine Corps UH-1Ns destined for the "boneyard" and use the common vertical lift support program funding to recondition these aircraft, which some say are just unable to meet the requirements as the Air Force needs them.

The question is, wouldn't it be better use of the almost \$53 million of the common vertical lift support platform funding to introduce an aircraft that can meet your requirements of the mission, even if it is limited quantities for now but considering the future. And the second part of that is additionally, without the acquisition resources available to satisfy this urgent and compelling need, as many of us see it, has the Air Force considered any more affordable alternatives, such as leasing aircraft to accomplish this mission?

General KANE. Thank you for the question, sir.

Basically, the requirement for the helicopter, for the common vertical lift support platform, for both the nuclear mission and the continuity of Government mission here in the NCR [National Capital Region] has not changed; the requirement remains the same. So the current platforms still lack in capacity, speed, range, endurance, force protection, survivability capabilities.

What we are doing right now is the Air Force, because of, frankly, some of the budget issues; we are taking a, what we are calling, an acquisition pause. And it is going to give us an opportunity to take a look at potentially more cost-effective ways of filling the requirements for this important mission. What we are doing is looking at—we have started by looking at things like enhancing the security at the missile sites by enhancing hardening and surveillance capabilities.

We are looking at the potential for changing the way the mission in the NCR is tasked, and we are looking at exploring other excess defense articles that might be modified into a platform that could satisfy that requirement better.

In terms of the Marine Corps UH-1Ns, the 22 that you have spoken about, we currently do not have a plan to spend that CVLSP money, the \$50 million, on modifying those airplanes. We are going

to, when we accept those airplanes between 2012 and 2014, we will put them into a storage condition. And we are going to have to study them to determine what sort of modifications would be necessary to either make them viable to participate in the mission, to be used for spare parts or what other disposition we would determine.

In terms of the CVLSP money, we do have, we will have some potential requirements, as I mentioned in my opening statement, to do safety, obsolescence. And then there will be some equipment availability or diminishing manufacturing sorts of issues with the current fleet that will have to be mitigated, and that is still open for decision in terms of whether some of that money might be used for the current fleet, but not to modify the aircraft that are being transferred from the Marine Corps.

Mr. LOBIONDO. So there is no discussion about leasing?

General KANE. No, sir, I don't recall any discussions from the program office in terms of leasing as one of the options, but there is nothing to say that we couldn't explore that as an option along with all the others for meeting this in a more cost-effective way.

Mr. LOBIONDO. So, essentially, the money for the common vertical lift support platform, that almost \$53 million, is not going to go towards operational needs of the Air Force. It is going to, just to wind down the program; is that what I am hearing?

General KANE. The \$53 million would be either rescinded or returned to the Air Force for other operational requirements at this point, but as I mentioned, we are creating a proposal for use of some of the funding that could—crashworthy seats, night-vision-capable cockpit equipment—that could enhance the capabilities of the current fleet in the short term. Decisions on that have not been made.

Mr. LOBIONDO. Okay, thank you, General.

Thank you, Mr. Chairman.

Mr. BARTLETT. Thank you.

Mr. Critz.

Mr. CRITZ. Thank you, Mr. Chairman.

Thank you, gentlemen, for being here, for your service to our country.

General Crosby, based on the elimination of the Sherpas and the C-27Js, with the move to the Air Force and then for close support, now we are only going to be using C-130s, has the Army adjusted or taken into account in your vertical lift plan or in this budget request any changes that will be made because now the Black Hawks will be used? Is there any changing in the plan and usage of Black Hawks due to this loss of the close support?

General CROSBY. No, sir. The changes—when we had the C-27 program, we, the Army resourced that, and the program office, of course, was under my control to procure that system to do that immediate mission for the Army. The senior leadership of the Army and the Air Force got together and made a decision; that was the Air Force mission. The Air Force agreed to take it, so we transferred that program to them. At that point there, was no funding or plan for the Black Hawk and Chinook to do any additional because we were going to have the C-27 to do the mission.

Mr. CRITZ. Right.

General CROSBY. Now, having said that, we have always counted on our utility aircraft and our cargo aircraft to go into those air fields where a fixed wing can't get to. There are many places in Afghanistan that it doesn't matter whether it is a Sherpa or a C-27 or C-130, they are not going to get there. So some of that resupply is going to continue to be done with our Black Hawks and Chinooks, and that has always been part of the plan, so, no adjustment there.

There are some air fields, a small number, that the C-27 could get to that the C-130 can't, about 1 percent I think, which is very negligible across Afghanistan. I will let my Air Force brothers talk to more detail of that. But the bottom line is there are C-27s there today. There are C-130s there today doing that time-sensitive mission for us, but I am not going to blow smoke, there are also missions over there that are being done by those Chinooks and Black Hawks because no fixed wing can get there.

General JONES. Congressman, I will just add to General Crosby's remarks that the Air Force is committed to providing the resources required, as asked for and tasked by the combatant commander. And we believe the C-130 is capable of doing that mission. In some environmental conditions, we believe it is better than the C-27, from a capacity standpoint, from a power pad standpoint. As General Crosby mentioned, there are a very small number of fields that the C-27 can get to that the C-130 cannot, but we believe that we can meet any requirement and are standing by for any additional tasking from the theater as required.

Mr. CRITZ. Okay, so if I understand correctly, there is not any—no one sees any change in the tempo of usage of Black Hawks and Chinooks to backfill where C-27 may have been able to get in?

General CROSBY. No, sir. That is correct, sir.

Mr. CRITZ. Okay, thank you. A couple years, 2½ years ago Department of Defense acquisition technology and logistics leadership asked industry to self-form the Vertical Lift Consortium. Based on the Department's experiences over the last 2½ years, can any of you comment on what the results of this partnership are and how the VLC will be utilized for future vertical lift initiatives?

General CROSBY. Sir, I will jump on that one because the Army has been very heavily engaged in that. The consortium, as I understood it, when we stood that thing up, was because we see duplication out there, I mean, industry have been great partners. They have got independent research and development dollars, they have, we have our S&T dollars.

What we were trying to preclude is duplication where we had a bunch of people going after the same technologies. The other thing is we in the Government, we don't do a lot of development, cutting-edge technology development. Our partners in industry, that is what they do, so we were willing to bring them on to be advisers to guide us as we look at these enabling technologies we needed to go to the future to prevent us from going down a rat hole and getting after something that really wasn't achievable.

So we brought them to be as an advisory panel. There was no commitment to award contracts of scope or anything like that. It was more of an advisory panel. In that, in this future vertical lift group that we have that meets—and we are going to meet again;

we are supposed to meet this week; it has been delayed a week—we are looking at that joint vertical lift medium that I mentioned. Those team members from the consortium sit on and participate as part of that team. This is not a Government-only thing. It is a joint and industry team that sits and advises, and they brief each time we get together as part of that. We consider that very critical, especially as S&T dollars get even shorter, so that we can encourage them to invest their IR&D [Internal Research and Development] towards those same, because I am not going to be able to go after all the enabling technologies we need. Hopefully, they will be able to pony up in some areas and help as well to get us towards that next hurdle, if you will. Does that answer your question, sir?

Mr. CRITZ. Yes, and just to go one step further, we are 2½ years in. Is there anything that can be identified as deliverable at this point that has been generated through this?

General CROSBY. As a result, I believe this summer, we will have a result. We have funded a couple of demos that are going to give us as a result of their help and the actual contract effort, we should come out with a performance specification of what we think this aircraft should be. We don't know. Some people are saying that, you know, it is going to be rotary wing. We don't know that. It may be a vertical lift. It may be a tilt rotor of some sort that we are going to go to, but based on the wind tunnel studies and the demonstrators that we have done and the input of this team, including the consortium, we hope to have a deliverable this summer of a specification that will guide us toward what our next step will be that we are going after. Does that make sense?

Mr. CRITZ. Yes. Thank you. So you said this summer?

General CROSBY. This summer.

Mr. CRITZ. Okay. Changing gears but again for you, General, the Army's budget request, \$272 million for 34 Lakota light utility helicopters. As I understand it, the Army's current policy doesn't permit these helicopters to be deployed in nonpermissive environments because of the 72's lack of defensive protection. Is the Army reconsidering this restriction on the Lakotas? And why not use them somewhere overseas like the Balkans or where the threat is low?

General CROSBY. Sir, that is a great question and it is one that is asked a lot by our industry partners. The LUH [Light Utility Helicopter], as you know, was bought, and it is what we consider a noncovered system. Therefore, we did not apply any aircraft survivability equipment to it. We did not do live fire, and the first question that comes in our mind of whether we allow this thing into a nonpermissive environment is the safety of that air crew.

Mr. CRITZ. Right.

General CROSBY. And because we have not provided all those safety provisions, now we know what it would cost to do that, we have estimated it if the decision is made to go do that, but my understanding as an acquisition guy that procures and maintains and sustains these systems, the Army is not entertaining at this time any option to go forward and put it in a nonpermissive environment. We are putting it in some pretty complex missions as far as doing the Border Patrol and working with the National Guard and Reserves doing that mission, but that is not considered a nonpermissive environment. So my understanding right now, the Army

position is we are not pursuing to put this aircraft in anything but as agreed to initially in the permissive environment.

Mr. CRITZ. Thank you, Mr. Chairman.

Mr. BARTLETT. Thank you.

Mr. Wilson.

Mr. WILSON. Thank you, Mr. Chairman, and thank all of you for being here today.

And, General Crosby, I think because you are sitting in the middle, all the questions are coming your way, but I am concerned about the issue of American tax dollars being spent to procure Russian-made Mi-17 helicopters for the Afghani and Iraqi air forces. As colleagues in the Senate have pointed out, we are purchasing these from—aircraft from a Russian company, Rosoboronexport, which is actively engaged in selling arms to the Syrian Government, which is in the midst of a murderous campaign that has already claimed nearly 9,000 lives.

Why are we continuing to purchase the Mi-17 instead of an American helicopter with two alternatives? First, I understand it is not complicated to teach a pilot to fly a similar aircraft. Why would we not purchase a similar American-made aircraft, such as the S-61? And, secondly, with the large amount of alpha model UH-60s still in the American fleet, what is preventing us from transferring some of these aging aircraft to the Afghani and Iraqi air forces?

General CROSBY. Sir, if I stall, can I cut my time down? I am kidding.

Mr. WILSON. Hey, you are still in the middle, but, anyway, good luck.

General CROSBY. Sir, that is a very tough question, I know one that everybody is wrestling with. We have to remember that the task that we have been given in Afghanistan and Iraq is to train those folks and equip them so that they can maintain and sustain their own military mission. The Afghanis have over 30 years of experience in Mi-17s. For us to bring—so this was a decision that was waylaid to us; it was a decision to look at how much time, cost, and effort would it be to introduce an American-made system.

Part of the responsibilities that you charter me with as a PEO [Program Executive Officer] is to maintain and watch over the industrial base of this country, so I do wrestle with that question, but the task was not to procure a utility aircraft that would work at that altitude; it was to buy an Mi-17 because that is what they are already trained. We have to remember the folks that we are training and equipping and working with over there, many of them can't read and write, and to introduce and bring the complex systems that we have, and while the SH-61 and the UH-60 alpha may seem pretty simple to us, compared to an Mi-17, they are pretty complex. The sustainment, the training base, all of those things associated with it have to be introduced and new. So that was a decision process.

Obviously, I didn't make that decision, but that was a decision process that was gone through when the Department of Defense and the State Department said go buy Mi-17s. Now I understand the concern about dealing with the Rosoboronexport. I will tell you that by us dealing directly with them, the sanctions came down that we are dealing directly with them, and you ask me, "Knuckle-

head, why are you doing that?" Simply, sir, because we have U.S. soldiers flying in, in the back and front of these airplanes, and we owe them the air worthiness and safety cognizance, and the only way that we could get that cognizance of those systems is to deal with them.

If the decision is made by the leadership of this country not to do that, then we will adjust, but that is the, that was the thought process of why we are where we are. We think we have made great strides in providing safe systems for those soldiers to fly in and to train our allies in to fly that system. I hope that has answered your question. It is still one tough to wrestle with.

Mr. WILSON. It does, but from new allies that we have, whether it be the former East Germany, the Slovakia, Poland, Bulgaria, Vietnam, hopefully they might have access. Anyway, I just urge you to look at that.

A final question is I had the opportunity, the Marines gave me a really extraordinary flight on an MV-22 Osprey, and on a visit to Iraq, we landed on a soccer field in downtown Haditha. We were greeted by the mayor, the chief of police, city officials. It was extremely impressive for our allies. And also I think a message to the other people, too, that we have capabilities. And I am also aware that the MV-22, the V-22, that the speed could be very helpful for wounded troops to give added capability for recovery. Is the Army planning to introduce V-22 Ospreys into the fleet?

General CROSBY. At this time, sir, no. The Army is not planning to buy any MV-22s. The Air Force and their Special Ops do have some that provide a lot of that rapid response capability, in the CSAR role. We use—our MEDEVAC [Medical Evacuation] was the UH-60 and the HH-60 in the MEDEVAC role. And you know the hour that we have, that magical mile that we do to take care of those soldiers, we have been able to exceed that with the systems that we have. A little bit different focus, a little bit different mission for us than the Marine Corps. We can buy many more Black Hawks than we can for the cost of one MV-22. That is not a criticism of the MV-22. For what it does, it is absolutely the best one out there. It just doesn't fit in the mission set of what the Army does today.

Mr. WILSON. Well, as a military parent with four sons serving in the military, I just want the best equipment. It surely impressed me that we can land on any soccer or football field in the world and how that projects our military personnel.

Thank you, Mr. Chairman.

Mr. BARTLETT. Thank you.

Ms. Tsongas.

Ms. TSONGAS. Thank you, Mr. Chairman.

And thank you all for being here to testify. As I have been to Afghanistan and Iraq, it is in my experience to fly on some of these rotorcraft, so it makes this discussion all the more real to me. But I have a question for I think anyone who wants to take it, and maybe that is all of you, but can you talk briefly about how our rotorcraft countermeasures are performing, and I can remember distinctly being in a Black Hawk in the sort of deep concentration that those who were tasked with flying it were engaged in to make sure we were safe, but can you talk about how these counter-

measures are performing in Afghanistan, and in terms of R&D, what will be the game changer in developing the next generation of countermeasures to meet whatever threats we may be facing in the future? Who wants to—

General ROBLING. I will give General Crosby a break here, he is probably getting thirsty. Ma'am, right now, our countermeasures are working very well. We are equipping, of course, the forward deployed 53s and the 46s with the most capable AIRCMM [Advanced Infrared Countermeasure Munition] system that we have got now, but all of the systems that we look to putting on our aircraft, both forward-firing flares, expandable chaff, radar-warning receiver capabilities, I think that the systems that we have now are working very well. We have R&D money against each of these aircraft to upgrade those systems as we pace the threat to include CIRCM [Common Infrared Countermeasures] and the JTS [Joint Tactical Simulation] system that is being developed by the Department of the Navy, which is another two-color system that is both IR and HIF [Hypoxia-Inducible Factors] radar warning.

So I think we are, the systems that we have got now are working, the systems that we are looking at in the future are probably what are going to be the game changers, and I think the game changer, if you will, for us is it is systems now that can be upgraded via software cost-effectively that pace the threat, and I think that is the most important thing for us.

General CROSBY. Ma'am, if I could add to that, General Robling is absolutely right, but the one that keeps me awake at night is that hostile fire, the simple systems, the RPGs [Rocket-Propelled Grenade] and the small arms. Those are the ones, the things he just talked about with the CIRCM and the ATIRCM [Advanced Threat Infrared Countermeasures] and the CMWS [Common Missile Warning System], those are okay, those do a great job, and those, as he said, we need to be upgrading because the threat is going to continue to evolve. But the one that makes us so vulnerable in the rotary wing because we are operating in such close proximity to those soldiers are those unsophisticated things like rocket-propelled grenades and small arms fire, so we are pursuing and I think the game changer is when we are going to be able to give the soldier and put on that aircraft something that identifies where that small arms is coming from, either—and we are looking at a couple of different technologies. One is an acoustic and one is a flash that will allow us to cue on it and, if nothing else, suppress it, which protects that air crew long enough to get out of that vulnerable spectrum.

When we can do that and put something reliable in their hands, that I think will be the next step, augmented with what General Robling already talked about.

Ms. TSONGAS. And where do you think we are in that process?

General CROSBY. Very well along, ma'am. Frankly, we have got one that is a flash that we are demoing, I have got it on the Apaches that are going in on this next rotation, and if that proves out, then we will have something that I think really will help protect them. The acoustic one is not quite as mature but is not far behind it.

Ms. TSONGAS. Great. Thank you.

General KANE. Congresswoman, the Air Force HH-60Gs and the CV-22s are some of the most survivable rotorcraft in DOD, from our perspective. Our efforts to focus on radio frequency and infrared countermeasures, chaff and flares, and maybe most importantly the integration piece of sensor and intelligence data in its presentation to the crew that allows it to do, to avoid the threats in the first place. So I think that is one of the most important pieces in terms of game-changing capabilities.

In terms of both platforms, we continuously pursue upgrades. We are implementing a hostile fire indicator on the HH-60, and anytime we have an opportunity to work jointly, we participate with the other Services. A good example would be our LAIRCM [Large Aircraft Infrared Countermeasures] program, participating with the CIRCIM in terms of lessons learned and technology transfer.

Ms. TSONGAS. Thank you all for your testimony.

Mr. BARTLETT. Thank you.

Miss Roby.

Mrs. ROBY. Thank you, Mr. Chairman, and thank you all for being here today, and General Crosby, as you know, my district is the home of Fort Rucker, and the U.S. Army Aviation Center. And the issues that we are here talking about today are certainly vital to what is happening, not just in my district, but the Army's Program Executive Office for Aviation, located at Redstone.

So thank you for being here.

And my first question is regarding, General Crosby, mission planning, and I am aware that the helicopter incidents were the third leading cause of fatalities in Iraq, in the Iraq war. And in Afghanistan, in 2008, helicopter-related losses were the number one cause of deaths, and so weather-related issues, disorienting brown-out conditions, engine failure, wire strikes, and flying into the terrain, of which the pilot was unaware, accounts for 80 percent of the losses. So what efforts is the Army and other Services, if anybody else wants to weigh in, executing to improve the mission planning performance for rotary wing operations?

General CROSBY. Thank you, ma'am.

I appreciate the question. What you just described, is operations of what is causing those problems, is operating in a degraded visual environment; what we called DVE, and anything we can do to minimize that impact. I will tell you the challenge within the mission planning, there are some that will tell you that we should use DTED [Digital Terrain Elevation Data] data and GPS in order to do that—global positioning system, but their probable errors, combine those two together and you can be as much as 30 to 35 feet off. And when you are going into a landing zone with rocks; that is not good enough. So what we are pursuing is some other technologies. I will tell you that within the Army, the three platforms that we don't worry about now is the Block III Apache, the F model Chinook, and the M model Blackhawk because we have integrated in their digital cockpits a degraded visual environment capability. And you see that the incidents with those aircraft have come way, way down.

So our focus right now is on those legacy platforms. The A model, L model Blackhawks, the Block II Apaches, the Kiowas, and the D model Chinooks. And each of those we are looking at, one of them

is an autonomous landing system called—it is called HALS—that we are looking at embedding, and it is kind of a strap-on system that we put on the aircraft to automate that system to give them some cues. There is also a radar that we looked at that actually we can apply that looks through the sand and gives them the visual cues they need to land the aircraft. But the key of all of this, there was a great learning curve when we were first in. It is not all materiel; there is also training and experience, and how do you mitigate things like this and how do you prepare and set up and do roll-on landing those kinds of things to mitigate. All of those together is what is going to get rid of this issue. It is a mix of the training, and of the degraded visual improvements.

Mrs. ROBY. Thank you so much, General.

Does anyone else want to weigh in?

General ROBLING. I will just pile on a little bit and just say that the Marine Corps is looking at the same things, and agree with General Crosby completely. It is not just the equipment. It is TTPs [Tactics, Techniques, and Procedures] and how you train, and how you figure those out. V-22 is a good example of how we have taken a system that really has been difficult in brownout-type conditions because of the size of those rotor blades on each side of the aircraft. And you go into a landing zone that is dusty; it is fully enveloped. So we have a GPS landing system in that aircraft you can, you know, walk on to your intended landing point, hover to about 50-foot and push a button and takes all the problems out, from the pilot's point of view, and bring it right down to safe landing.

Other types of systems in the CH-53, not quite that sophisticated, but all that help with brownout and we look at, with all of the Services, on developing better systems in that direction.

Mrs. ROBY. Yes, sir.

General JONES. Congresswoman, I will add to the comments of my colleagues here that the Air Force is the executive agent on a Joint Capabilities Technology Demonstration led by our Air Force research's lab out at Wright-Patterson Air Force Base, that is examining what we are calling a three-dimensional landing zone capability that will provide a high-resolution display integrated into the flight ware and display to the pilots in the aircraft that will allow us to better navigate through this degraded visual environment that we are discussing here. So along with the other Services, we are actively pursuing capabilities in that regard as well.

Mrs. ROBY. Thank you all so much, and again, I appreciate your time and being here and your service to our country.

And Mr. Chairman, I yield back.

Mr. BARTLETT. Thank you very much.

Of the 20 questions that we needed to ask in discharge of our oversight responsibilities, I am happy to report that 13 of them have been asked, which is why I ask my questions last, hoping they will all have been asked.

Mr. Critz asked some questions about the C-47, I would just like to ask, General Crosby, one follow-up question, follow-up question relative to that. Can you speak to the costs incurred in the C-47 in the past for missions that should or could have been executed by platforms, such as the C-27J? Are you concerned that the bur-

den on the Chinook and associated costs will be increased with the divestment of the C-27J?

General CROSBY. Sir, I cannot speak to you and tell you what the cost differential is on the 47 today. I am sure we could derive those numbers, but the mission, as I mentioned, is very hard to differentiate, when that aircraft, as you know, as a mission aircraft is doing air assaults, is doing resupply, so many things, but it is going to areas that a C-27 or a Sherpa couldn't get to anyway. So it is a cargo helicopter, and that is what we bought it for. The C-27, as I said, is there today and supporting us. I am confident that the leadership of the United States Army and the United States Air Force have come together, and the Air Force has said, Hey, this is our mission, and we will support you. And I am—I have no reason to doubt that think brothers in blue will be there when we need them.

Mr. BARTLETT. Is not the 47 one of the most expensive airplanes we have to fly per hour cost?

General CROSBY. It is expensive, sir. It drinks fuel. It is the biggest. It is the heaviest, but it is also, I think, very, very reliable, especially with the new F model, and we have driven down some of those costs. But yes, sir, it is probably the most expensive of the ones we have.

Mr. BARTLETT. So is it not true that every time we have to use the 47 because the C-27J or a similar airplane was not available, we have had considerably increased costs?

General CROSBY. Yes, sir, but I can't look you in the eye today and tell you what those numbers are and how many missions we have done. The C-27s have not been there the whole time, so we have been flying the Chinooks doing that mission, but since they have been there, they have been executing that time-sensitive, critical-cargo mission for us. So that has eliminated some of that time, which that doesn't mean that aircraft is sitting. We have not seen a reduction in OPTEMPO by them doing that mission, and that aircraft is being used for something else.

As you know, we are flying all of our aircraft at four to six times the normal OPTEMPO of what we normally experience. It is just a credit to our soldiers that they are able to maintain and sustain that kind of readiness.

Mr. BARTLETT. One of your fellow officers had noted that we are, and I quote him, flying the blades off the CH-47. Would you concur?

General CROSBY. Sir, I would say we are flying the blades off of all of them. I will tell you that the OPTEMPO plan for these aircraft in peace time was about 14.7 hours a month. We are flying in excess on the Kiowas over 100 hours a months. The Chinooks and Blackhawks are in the 70 to 80—60 to 80 range. So we are flying the blades out of all of them.

I have some concerns about the sustainability and the long-term strategy of all the fleet, which I have got some studies and some analysis looking at it. So I wouldn't say just the 47 needs to be looked at. I think we need to be concerned about all of them.

Mr. BARTLETT. NASA is the National Aeronautical and Space Administration. It appears that most of their focus is on space rather than aeronautical. One of their original chartered responsibilities

was R&D and rotorcraft. I am not aware that they are doing much there. Have I missed something?

General CROSBY. Sir, I will tell you that we do do some studies, and some analysis with them. It is not a great deal. It is—there is a team at Langley that we use that—in fact, it is an old comrade of mine from my early acquisition days—that we use and they participate in our Joint Vertical Lift Consortium, and help us—guide us to the future. But are they there present and every day in my engineering design? No, sir.

Mr. BARTLETT. I would like to ask a question of the Navy. As you look forward, which of your helicopters will you be relying on primarily for search and rescue?

General MORAN. Thank you, Mr. Chairman.

I think we are going to see both the 60 Romeo and the 60 Sierra in that role. Sierra is our primary aircraft in search and rescue at sea.

Mr. BARTLETT. These are 60s, correct?

General MORAN. Yes, sir, they are.

Mr. BARTLETT. All right. Is not that plane pretty limited in range and dwell time? Wouldn't that be much better done by a medium-lift helicopter with considerably more range and dwell time?

General MORAN. We think the Sierra has, when we are talking about search and rescue at sea, the Sierra is more than adequate for that mission. We certainly will be working with the future vertical lift as we look in the future to see if we can make gains in that area.

Mr. BARTLETT. As you look forward, which rotary-wing aircraft will you be using primarily for medical evacuation?

General MORAN. We continue to contribute with our HH-60s in Iraq and Afghanistan on medical evacs when called upon in support of SOF [Special Operations Forces].

Mr. BARTLETT. Is it not true that the 60 is pretty limiting in terms of range and size? It really doesn't even come close to providing enough room for an emergency—aerial emergency room, does it? Are we not using the 60 because we no longer have a medium-lift helicopter that we should be using for both of these missions?

General MORAN. From the Navy standpoint, Mr. Chairman, I would have to get back to you on why, but I think we will continue to look at that as we look at future capabilities and requirements for the medium lift.

[The information referred to can be found in the Appendix on page 79.]

Mr. BARTLETT. Because both of these critical missions would be better accomplished with a larger aircraft, with more dwell time, with more size, with the longer—with the longer range.

General Crosby, the Army Improved Turbine Engine Program envisions significantly more fuel-efficient and powerful engine for the Blackhawk and the Apache helicopter fleet as well as the next generation of joint multiple role helicopters. Can you please explain what measures the Army is taking in this acquisition strategy to ensure there is competition between the science and technology phase and into engineering, manufacturing, development.

General CROSBY. Yes, sir, I appreciate the question. That is a great capability, and I am here to tell you, let me go on record as stating that the demo thus far, is demonstrating 30 percent increase in power, and 25 percent reduction in fuel. That is absolutely huge if you put that across the entire fleet in the Army, and in our brothers in the Navy, and Marine Corps, and the Air Force. Again, applicable to all of those fleets, and looking to our future to be the power plant for our future system. The acquisition strategy as we go forward and transition this from S&T, to a materiel acquisition program, is to encourage that competition in throughout the EMD [Engineering and Manufacturing Development] phase. That is part of our strategy. That is our plan. The only thing that will affect us of course, is the affordability. If we aren't able to garner sufficient funds to do, to maintain that through EMD, we would have to down select earlier. But our plan right now is to carry two vendors through the EMD phase.

Mr. BARTLETT. Mr. Reyes, do you have additional questions or comments?

Mr. REYES. Just a couple, but I will take them for the record.

Mr. BARTLETT. You will take them for the record.

Okay, let me ask a question about the 53-K. Are we going to have a period of time where we will not have a heavy-lift helicopter available to us because of the timeline in developing this helicopter?

General ROBLING. No, sir, 53-K right now is being developed for an IOC of 2019, and I believe right now we continue to keep CH-53 Echoes out to the end of that transition through fiscal year 2023.

Mr. BARTLETT. Okay, we decided that we can extend their useful life until the K is ready?

General ROBLING. Yes, sir. There will be some risks there, as in all legacy aircraft. And we may right now that plan is for 8 squadrons of CH-53 Echoes at 16 aircraft per squadron, and because we no longer make those aircraft, as we lose them or the life of the aircraft goes down, what we will do is reduce the PAA [Primary Assigned Aircraft] in the squadrons, you know, down to 14 and then 12, but the answer to your question is, we will have a heavy-lift helicopter while that is being developed and transitioned.

Mr. BARTLETT. Okay, Mr. Reyes.

Mr. REYES. Yeah, I just have one quick one for you, General Crosby. The Army Improved Turbine Engine Program, which envisions a significantly more fuel-efficient and powerful engine for the Blackhawk and Apache helicopter fleet, as well as the next-generation joint multirole helicopter. Can you please explain what measures the Army is taking in the acquisition strategy to ensure that there is competition beyond the science and technology phase into the engineering and manufacturing development?

General CROSBY. Yes, sir. As again, what a great capability and in the tech base, it is demonstrating all of the improvements that we ask for. We are in the process right now, the project manager, of taking this from S&T and we go through what we call a materiel development decision, which lays out the acquisition strategy for that program. Our intention, our plan as we put that together is to carry two vendors through the EMD phase, to promote that com-

petition beyond the S&T phase. The only thing that would restrict our ability to do that would be affordability, whether we can garner enough funds to do that.

Mr. REYES. Very good.

Thank you, Mr. Chairman.

Mr. BARTLETT. Thank you very much.

As we review your testimony and the question and answer period, I am sure that we will have additional questions for the record in discharge of our responsibilities for oversight. Thank you all so much for your service and your testimony.

The subcommittee stands in adjournment.

[Whereupon, at 4:15 p.m., the subcommittee was adjourned.]

A P P E N D I X

MARCH 27, 2012

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 27, 2012

Statement of Hon. Roscoe G. Bartlett
Chairman, House Committee on Tactical Air and Land
Forces
Hearing on
Fiscal Year 2013 DOD Rotorcraft Modernization Programs
March 27, 2012

Good afternoon. Thank you for joining us.

I would like to welcome our witnesses:

- Lieutenant General Terry Robling, Deputy Commandant for Aviation, U.S. Marine Corps;
- Rear Admiral William Moran, Director, Air Warfare Division, U.S. Navy;
- Mr. Richard Gilpin, Deputy Assistant Secretary of the Navy, Air Programs Office;
- Major General William Crosby, Program Executive Officer Aviation, U.S. Army;
- Major General Noel Jones, Director, Operational Capability Requirements, U.S. Air Force; and
- Major General Robert Kane, Director, Global Reach Programs, U.S. Air Force.

Thank you all for being here and for your service to our Nation.

The use of helicopters has dramatically changed warfare doctrine from the time of their introduction during the Korean War, followed by development prior to Vietnam, use during Vietnam as a mobility platform, and current rotorcraft aviation operations. The helicopter is now a platform of maneuver, used for multimissions to include, resupply, medical evacuation, reconnaissance, air assault, and attack operations.

The U.S. armed forces currently have approximately 7,000 helicopters. Operations in Iraq and Afghanistan have put an even greater reliance on rotorcraft support as a result of Improvised Explosive Devices which have restricted ground movement. Based on current planned force structure reductions, the demand for rotorcraft capability will be even more critical in the future. Maintaining a healthy fleet of rotorcraft equates to the total force having the ability to cover the wide area battle space as referenced in the National Security Strategy.

The purpose of this hearing is to get an update from each Service as to the condition of their respective current rotorcraft fleet and plans for future upgrades and modernization. In addition to various platform updates, the committee hopes to learn how the Services are utilizing Research and Development dollars to develop the next

generation of rotary wing systems and subsystems. And finally, given the likelihood that there will be a continued or even greater dependence on rotorcraft in the future and the likelihood that rotorcraft will have to operate in greater threat environments than they currently do in Afghanistan, the committee expects to learn what each Service is doing in regard to aircraft survivability equipment and how they are working together to maximize resources.

Again, I thank all of you for your service to our country and for being here. I look forward to your testimony.

Statement of Hon. Silvestre Reyes
Ranking Member, House Committee on Tactical Air and
Land Forces
Hearing on
Fiscal Year 2013 DOD Rotorcraft Modernization Programs
March 27, 2012

Today's hearing on DOD rotorcraft programs is the first Tactical Air and Land Forces hearing specifically covering these programs in many years. And, based on the budget request for fiscal year 2013, a hearing is definitely warranted for several reasons.

One major issue is the cost of these rotorcraft programs, and how they impact other areas of military service budgets. The Army 2013 request, for example, includes \$4.3 billion for procurement of upgraded and new rotorcraft, including Blackhawk, Chinook, Apache, Kiowa, and Lakota helicopters.

By comparison, the Army's request for Weapons and Tracked Combat Vehicles in 2013 is only \$1.5 billion—less than half as much.

The Marine Corps request for rotorcraft programs totals \$1.4 billion for just two major programs—new AH-1Z and UH-1Y helicopters and the CH-53K development program. If one adds the V-22 program to that amount, the total for the Marine Corps is more than \$3.0 billion. This \$3 billion total exceeds the Marine Corps' entire ground equipment procurement budget, which is about \$2.5 billion.

The other two Services have somewhat lower requests, with the Navy's request at \$1.2 billion, and with the Air Force coming in around \$500 million. If one totals up the Service requests for rotorcraft programs you get around \$9.0 billion, with the vast majority of that funding being procurement of new or upgraded aircraft.

So, it is clear that rotorcraft programs are a priority for all the Services, and in particular the Army and Marine Corps. Overall this strong investment in updating and replacing the Services' rotorcraft fleets is a good thing.

However, one concern I have is how skewed this funding request is in favor of *production* of new manned rotorcraft, as opposed to *Research and Development* of new rotorcraft for the future. This imbalance is, in part, the result of the termination of almost every new manned rotorcraft program DOD has tried to start in recent years. For example, the Army has little funding for R&D of new rotorcraft after the termination of the Comanche and Armed Reconnaissance Helicopter programs. The program intended to follow those two efforts remains mired in a seemingly endless analysis of alternatives, with no clear path ahead.

Likewise, the Air Force canceled the "CSAR-X" combat rescue helicopter program in 2009, and this year canceled its program to replace its ageing U-1 Huey helicopters. Both have yet to restart.

The Navy continues to struggle with defining requirements for the new Presidential Helicopter, almost three years after termination of the VH-71 program in 2009. Only the Marine Corps has

a large scale, and so far successful, R&D program under way with the CH-53K heavy lift helicopter program.

Another concern I have is the lack of commonality in some mission areas between the Services. The Army, Navy, and Air Force all fly variants of the UH-60 helicopter, which produces significant savings in both production and support costs. The Marine Corps, in contrast, is fielding rotorcraft unique in DOD, including the upgraded AH-1Z Cobra, the UH-1Y Huey, and the CH-53E Super Stallion. This does not mean that the Marine Corps programs should be stopped or reduced, but I believe it does raise the issue of how in the future—for the next generation of rotorcraft—DOD can better achieve truly joint solutions.

Finally, with respect to unmanned rotorcraft, there are several promising research and development efforts under way, with the Navy and Marine Corps leading the way with the MQ-8 and the Cargo Resupply Unmanned Aerial System. While funding for those efforts is relatively small compared to manned rotorcraft programs, they could be important waypoints toward future efforts.

I look forward to the testimony from our panel.

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

STATEMENT OF

LIEUTENANT GENERAL TERRY G. ROBLING, USMC
DEPUTY COMMANDANT FOR AVIATION

AND

MR. RICH GILPIN
DEPUTY ASSISTANT SECRETARY OF THE NAVY (AIR PROGRAMS)

AND

REAR ADMIRAL WILLIAM F. MORAN, USN
DIRECTOR, AIR WARFARE

BEFORE THE

TACTICAL AIR AND LAND FORCES
SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

DEPARTMENT OF THE NAVY'S ROTORCRAFT MODERNIZATION PROGRAMS

MARCH 27, 2012

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

INTRODUCTION

Mr. Chairman, Representative Reyes, 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) Rotorcraft Modernization programs. Our testimony will provide background and rationale for the Department's Fiscal Year 2013 Budget request for rotorcraft modernization programs that will make investments aligned to our strategic priorities and budgetary goals.

The vertical lift capability provided by the department's rotorcraft platforms is a key enabler of the Navy and Marine Corps ability to come from the sea and conduct missions rapidly across the range of military operations. The speed, range, and flexibility provided by these platforms when coupled with air capable ships give our nation unmatched global reach and expeditionary agility. The range of missions supported by vertical lift aircraft are unparalleled; these airframes are used to move troops and materials, conduct search and rescue, evacuate casualties, deliver humanitarian aid and disaster assistance, conduct reconnaissance, hunt submarines, clear mines, provide air assault and close air support. They can deliver and retrieve personnel and material practically anywhere, including ship decks, open water, unimproved landing sites, roof tops, and the White House lawn. This versatility has made them a ubiquitous and inseparable part of the blue and brown water Navy and Marine Corps expeditionary forces.

The Fiscal Year 2013 DoN Budget request, while less than was requested in Fiscal Year 2012 aligns with the new strategic guidance for the Department of Defense (DoD) and provides the Department with the best balance of naval aviation requirements. The DoN Fiscal Year 2013 aircraft program budget is funded for planned program execution throughout the Future Years Defense Program (FYDP).

The Fiscal Year 2013 President's Budget requests funding for 82 manned rotorcraft including 17 MV-22B tiltrotor aircraft, 15 UH-1Y and 13 AH-1Z helicopters, 19 MH-60R and 18 MH-60S helicopters. The Budget request also addresses the continued development of the CH-53K and VXX to recapitalize the aging fleets of CH-53E and VH-3 and VH-60 rotorcraft.

In Fiscal Year 2013, three major rotorcraft modernization programs are in full rate production: the MH-60R/S, the H-1 Upgrades, and the MV-22B. Two of these programs, the MH-60R/S and MV-22B, are using multi-year procurement (MYP) strategies to achieve substantial procurement cost savings. The CH-53K program continues to progress through the Systems Development and Demonstration (SDD) phase, and VXX is updating the Analysis of Alternatives (AoA) and preparing for a Defense Acquisition Review Board for a development decision. The Department continues to support and participate in the DoD's Future Vertical Lift initiative.

Guided by the Defense Strategic Guidance, the Navy-Marine Corps team is built for war, capable of operating forward to preserve the peace, respond to crises and protect United States and allied interests. Rotorcraft modernization continues to focus on expanding vertical lift capacity, range, and speed while improving survivability, availability, and affordability.

ASSAULT SUPPORT AIRCRAFT

MV-22

The Fiscal Year 2013 President's Budget requests \$54.4 million in RDT&E, N for continued product improvements and \$1.5 billion in APN for procurement of 17 MV-22Bs (Lot 17) and \$95.9 million for continuation of follow-on block upgrades. Fiscal Year 2013 is the first year of the planned follow-on V-22 MYP contract covering Fiscal Year 2013-2017. The funds requested in the Fiscal Year 2013 President's Budget fully fund Lot 17 and procure long lead items for Lot 18 as well as Economic Order Quantity buys for Lots 18 - 21. The Marine Corps continues to field and transition aircraft on time. The APN request includes \$95.9 million to support the ongoing Operations and Safety Improvement Programs (OSIP), including Correction of Deficiencies and Readiness.

The MV-22B has been supporting the Marines continuously since October 2007, in extreme environmental conditions during thirteen deployments to Iraq, Afghanistan and aboard amphibious shipping. In February 2011, the V-22 fleet exceeded a total of 100,000 flight hours. The MV-22B squadrons in Afghanistan and the Marine Expeditionary Unit (MEU) are seeing mission capable rates in the seventy percent range and are performing every assigned mission. Additionally, the Osprey has the lowest Class A flight mishap rate of any USMC fielded tactical rotorcraft over the past ten years.

The effectiveness and survivability of this revolutionary, first-of-type MV-22B Osprey tiltrotor has been repeatedly demonstrated in combat. The rescue of a downed F-15E airman during Operation ODYSSEY DAWN was an example of what the Navy and Marine Corps' expeditionary force brings our nation. As an integral part of that seaborne presence, the MV-22B was able to perform its mission with unprecedented speed and agility. Twenty minutes from the time he was evading capture in hostile territory, the rescued pilot was safely back on American territory aboard USS KEARSARGE.

Under the existing MYP, Ospreys have been delivered under cost and on time. The fifth and final buy of the current multi-year occurred in Fiscal Year 2012. The Fiscal Year 2013 President's Budget request includes provisions for a follow-on five year MYP (FY13-17) which builds on the successes of the first. The follow-on MYP will procure 91 MV-22Bs over five years and produce significant savings when compared to a series of single year procurements. This procurement strategy supports the Marine Corps' need to retire older aircraft and field more advanced capabilities. Additionally, the MYP contract provides out year stabilization of the supplier base and enables long-term cost reduction initiatives on the part of the prime contractors and their suppliers.

The introduction of this new tiltrotor capability into combat has provided valuable lessons with respect to readiness and operating costs. Improvements to both continue and are having a clear effect on increasing aircraft availability and decreasing flight hour costs. At the close of Fiscal Year 2011, the mission capability rate of the MV-22B was up 19 percent over Fiscal Year 2010 and the cost per flight hour decreased 13 percent in the same period. Due to these cost reduction efforts, the V-22 program received the prestigious David Packard Excellence in Acquisition

Award which recognizes exemplary performance and innovation acquiring and delivering products and capabilities to the warfighter.

To keep these improvements on track, we introduced a readiness OSIP into the Fiscal Year 2012 President's Budget. This OSIP provides a stable source of crucial modification funding as we continue to improve readiness and reduce operating cost.

The MV-22B capability is being increased and fielded over time via a block upgrade acquisition strategy. The great benefit of a fly-by-wire rotorcraft was very clear recently when we increased airspeed and lift by simply modifying the flight control software. Such improvements require thorough testing and Fiscal Year 2013 RDT&E,N funds requested will be utilized to complete the fully-instrumented test aircraft to replace the existing test aircraft. The current test aircraft is five iterations behind the V-22 being flown today and requires hundreds of maintenance man-hours per flight hour to operate and maintain.

CH-53K Heavy Lift Replacement Program

The Fiscal Year 2013 President's Budget requests \$606 million RDT&E,N to continue SDD of the CH-53K. Since completing its Critical Design Review in July 2010, the CH-53K program began system capability and manufacturing process demonstration, and started fabrication of the first test aircraft. During Fiscal Year 2013, the program will continue work on manufacturing the various test articles needed to support developmental test activities to achieve the planned first flight of the CH-53K in 2014.

The new build CH-53K will replace the legacy fleet of CH-53D/E helicopters with an aircraft that provides the performance necessary to support our future warfighting requirements. The CH-53E Super Stallion provides unparalleled combat assault support to the MAGTF and is one of the Marine Corps' most-stressed aviation communities. CH-53s, providing vital lift of heavy equipment, supplies and troops, are currently deployed in Afghanistan, the Horn of Africa, and onboard ship with our MEUs. Since May 2011, CH-53D/Es have flown over 19,000 hours; carried more than 73,000 passengers and moved over thirteen million pounds of cargo in support of coalition forces in Afghanistan and the Horn of Africa while flying well above their programmed rates in austere, expeditionary conditions. The need for heavy lift support has increased substantially when compared to last year's numbers over the same reporting period. The only heavy lift helicopters deployed to Afghanistan, CH-53D/Es have performed combat external recoveries of five coalition helicopters during this period. Forward-deployed aircraft have been operating at up to three times the peacetime utilization rates.

To keep these platforms viable until the CH-53K enters service, the Fiscal Year 2013 President's Budget requests \$61.4 million for both near and mid-term enhancements, including Integrated Mechanical Diagnostic System, T-64 Engine Reliability Improvement Program kits, Directed Infrared Countermeasures, Critical Survivability Upgrade, and sustainment efforts such as Kapton wiring replacement. While these aircraft are achieving unprecedented operational milestones, they are nearing the end of their service life. The CH-53E is approaching 30 years of

service and the CH-53D is scheduled to retire from active service in late 2012, after operating for almost forty years.

The new-build CH-53K will fulfill land and sea based heavy-lift requirements 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 the high altitude, hot weather conditions similar to those found in Afghanistan, greatly expanding the commander's operational reach.

Maintainability and reliability enhancements of the CH-53K will improve aircraft availability and operational effectiveness over the current CH-53E with improved cost effectiveness. Additionally, survivability and force protection enhancements will increase protection dramatically, for both aircrew and passengers, thereby broadening the depth and breadth of heavy lift operational support to the joint task force and MAGTF commander. Expeditionary heavy-lift capabilities will continue to be critical to successful land- and sea-based operations in future anti-access, area-denial environments, enabling seabasing and the joint operating concepts of force application and focused logistics.

ATTACK AND UTILITY AIRCRAFT

UH-1Y / AH-1Z

The Fiscal Year 2013 President's Budget requests \$31.1 million in RDT&E, N for continued product improvements and \$824.1 million in APN for 28 H-1 Upgrade aircraft: 15 UH-1Y and 13 AH-1Z (includes one OCO) aircraft. The program is a key modernization effort designed to resolve existing safety deficiencies, to enhance operational effectiveness, and to extend the service life of both aircraft. The 85 percent commonality between the UH-1Y and AH-1Z will reduce lifecycle costs and logistical footprint significantly, while increasing the maintainability and deployability of both aircraft. The program will provide the Marine Corps 349 H-1 aircraft through a combination of remanufacturing and new production.

The H-1 Upgrades Program is replacing the Marine Corps' UH-1N and AH-1W helicopters with state-of-the-art UH-1Y and AH-1Z aircraft. These legacy aircraft have proven enormously effective over decades of heavy use, and as they reach the end of their service lives, we look forward to expanding utility and attack helicopter capabilities. The new "Yankee" and "Zulu" 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 (CAS) system designed to tie these airframes, their sensors, and their weapons systems together with ground combat forces and capable DoD aircraft. Low-cost weapons such as the Advanced Precision Kill Weapon System II (APKWS II) will increase lethality while reducing collateral damage.

The UH-1Y “Yankee” aircraft achieved Initial Operating Capability (IOC) in August 2008 and Full Rate Production (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 AH-1Z completed its operational evaluation (OT-II3C) in June 2010 and received approval for FRP in November 2010. As of January 31, 2012, 75 aircraft (54 UH-1Ys and 21 AH-1Zs) have been delivered to the Fleet Marine Force; an additional 56 aircraft are on contract and in production. Lots 1-5 aircraft deliveries are complete and Lot 6 deliveries are progressing on schedule. To date, all aircraft deliveries since Lot 3 have been completed ahead of the contracted schedule date.

The AH-1Z achieved IOC in February 2011 and in November 2011, the first all-Upgrades (UH-1Y/AH-1Z) MEU departed on November 15, 2011 with the USS MAKIN ISLAND Amphibious Ready Group. The UH-1Y completed its first overseas deployment with the 13th MEU in July 2009 and has supported sustained combat operations in Operation Enduring Freedom (OEF) since November 2009. The fourth OEF UH-1Y deployment (nine aircraft) is on-going, and aircraft continue to meet required readiness goals. This deployment marks two years in OEF with the UH-1Y flying nearly 11,500 hours in support of combat operations. The aircraft continue to fly three times the normal continental United States (CONUS) based utilization rate in OEF, and increased sortie rates are expected in support of the 11th MEU. The combined UH-1Y/AH-1Z fleet has flown over 44,000 hours since first delivery in January 2007.

In December 2011, to address existing attack helicopter shortfalls, the Marine Corps decided to pursue an all AH-1Z Build New (ZBN) procurement strategy and leave AH-1W airframes in inventory rather than removing them to begin the remanufacture process. The transition to an all ZBN airframe strategy is planned to begin with Lot 10 (Fiscal Year 2013) as reflected in the current USMC program of record. The previous mix of 131 remanufactured AH-1Z and 58 ZBN aircraft has been revised to delivery of 37 remanufactured AH-1Z and 152 ZBN aircraft. The total aircraft procurement numbers remain the same at 160 UH-1Ys and 189 AH-1Zs for a total of 349 aircraft.

ANTISUBMARINE AND SUPPORT HELICOPTER

MH-60R and MH-60S

The Fiscal Year 2013 President’s Budget requests \$843.1 million for 19 MH-60R aircraft including Advanced Procurement (AP) for 19 Fiscal Year 2014 aircraft and \$6.9 million RDT&E,N for continued replacement of the Light Airborne Multi-Purpose System MK III SH-60B and carrier-based SH-60F helicopters with the MH-60R. The RDT&E,N funds will continue development of the following: Mode V interrogation capability for the identification friend-or-foe system; and an aluminum gearbox which is replacing the current magnesium gearbox to reduce corrosion and total ownership cost. The Automatic Radar Periscope Detection and Discrimination program, a fleet-driven capability upgrade to the APS-147 Radar, is scheduled for IOC in fourth quarter, Fiscal Year 2013.

The MH-60R is used in both ASW with its dipping sonar, sonobuoys and torpedoes and in the surface warfare (SUW) role with its Electronics Surveillance Measures system, multimode radar with inverse synthetic aperture radar, Forward Looking Infrared (FLIR) system and Hellfire missiles. It has demonstrated significant improvement in capability in the ASW and SUW capability roles over legacy systems. The MH-60R program achieved FRP in 2006 and the fifth MH-60R operational deployment is currently underway with HSM-77 aboard the carrier USS ABRAHAM LINCOLN (CVN 72). There are five operational Carrier Air Wing squadrons and two fleet replacement squadrons operating the MH-60R. Three additional air wing and two Expeditionary operational squadrons will transition to the MH-60R by the end of Fiscal Year 2013.

The Fiscal Year 2013 President's Budget requests \$456.9 million in APN for 18 MH-60S aircraft including AP for 18 Fiscal Year 2014 aircraft and \$29.7 million in RDT&E,N funds for the MH-60S to continue development of the Organic Airborne Mine Countermeasures (OAMCM) (Block II) and the Armed Helicopter (Block III) missions. The MH-60S is the Navy's primary combat support helicopter designed to support carrier and expeditionary strike groups. The MH-60S has replaced three legacy Navy helicopter platforms. The basic MH-60S reached IOC and FRP in 2002. The Armed Helicopter configuration reached IOC in 2007 and OAMCM is scheduled to reach IOC with the LCS Mission Module in 2014. The fifth MH-60S operational deployment is currently underway with HSC-12 aboard USS ABRAHAM LINCOLN (CVN 72). MH-60S helicopters currently operate with self-defense equipment, crew-served weapons and Hellfire missiles. MH-60S configuration enhancements include Fixed Forward Firing Weapons that will begin fielding in 2012. There are five operational Carrier Air Wing squadrons, six Expeditionary squadrons, and two fleet replacement squadrons operating the MH-60S. One additional air wing squadron will transition to the MH-60S by the end of Fiscal Year 2013.

The Fiscal Year 2012 National Defense Authorization Act and Consolidated Appropriations Act included Congressional authority to enter into the joint Army UH-60M/HH-60M and Navy MH-60R/S helicopter MYP contract (MYP8) and the Navy MH-60R/S Mission Systems and Common Cockpit contract (MYP2).

EXECUTIVE SUPPORT AIRCRAFT

VH-3D/VH-60N Executive Helicopters 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 and Vice President of the United States, the Department is working closely with HMX-1 and industry to sustain these aircraft until a Presidential Replacement platform is fielded. The Fiscal Year 2013 President's Budget requests an investment of \$58 million to continue programs that will ensure the In-service Presidential fleet remains a safe and reliable platform. Ongoing efforts include the Cockpit Upgrade Program for the VH-60N, Communications Suite Upgrade, Structural Enhancement Program and the Obsolescence Management Program. The VH-3D Cockpit Upgrade Program, a Fiscal Year 2012 new start program, will provide a common cockpit with the VH-60N and address obsolescence issues. Continued investments in the In-service fleet will ensure continued safe and reliable execution of the Executive Lift mission.

VH-71 / VXX Presidential Helicopter Replacement Aircraft

The Fiscal Year 2013 President's Budget includes \$61.1 million for continuing efforts on VXX, the follow-on program for presidential helicopters. The Fiscal Year 2013 request reflects a funding adjustment that is a result of re-phasing the VXX program.

The requirement for a replacement Presidential helicopter was validated by the Joint Requirements Oversight Council; the details and specifications on how the requirement will be met safely and affordably have not yet been finalized. VXX activity in 2012 will focus on completing the update to the AoA, and to continue to develop an acquisition strategy that targets affordability, cost control and reduction of risk prior to the award any major contracts. The Navy will leverage the results from the risk and cost reduction activities associated with maturing technologies to not only improve the functionality and sustainment of the In-Service Presidential Helicopter fleet, but to also position the replacement program for optimal execution.

Lieutenant General Terry G. Robling

Deputy Commandant for Aviation

Lieutenant General Robling entered the Marine Corps in 1976 after graduating from Central Washington University with a degree in Business Administration. Following graduation from the Basic School in April 1977, he began flight training and earned his wings in November 1978.

Upon completion of F-4 Phantom transition training at MCAS Yuma, Arizona, he reported to MCAS Kaneohe Bay, Hawaii, and joined the "Lancers" of VMFA-212. As a "Lancer," he attended TOPGUN and participated in two WestPac deployments to Iwakuni, Japan. During his three-year tour with VMFA-212, he held various billets including Maintenance Control Officer, Assistant Maintenance Officer, and Aircraft Maintenance Officer.



In June 1983, Lieutenant General Robling reported to Amphibious Warfare School in Quantico, Virginia and upon graduation returned to MCAS Kaneohe Bay for duty with VMFA-235. As a "Death Angel," he held assignments as the Assistant Operations Officer and Aircraft Maintenance Officer, completed two more WestPac deployments and attended the Weapons and Tactics Instructor Course.

In June 1987, Lieutenant General Robling reported to Headquarters Marine Corps where he served as Aviation Programs Officer for the Deputy Chief of Staff for Aviation. During this tour, he was one of 24 officers selected for F/A-18D transition on the first "Delta" transition board. In August 1989, he reported to VMFAT-101 at MCAS El Toro for F/A-18 Hornet transition training, after which he remained with the "Sharpshooters" as the Aircraft Maintenance Officer as well as a pilot and weapon systems officer instructor.

In December 1990, Lieutenant General Robling reported to the newly redesignated VMFA(AW)-242 and assumed the duties as Executive Officer. In June 1992, he was reassigned as the Commanding Officer of VMFA(AW)-242 and completed another WestPac deployment to Iwakuni, Japan. As the Commanding Officer, Lieutenant General Robling was selected as the Marine Corps Naval Flight Officer of the Year in 1993.

In August 1994, Lieutenant General Robling reported to the National War College where he obtained a Master of Science Degree in National Security Strategy. Following graduation, he reported to the Chairman, Joint Chiefs of Staff, Washington, DC for duty as the Current Operations Officer, Central Command Division of the Joint Operations Department.

In August 1998, Lieutenant General Robling was selected for a Foreign Affairs Fellowship and attended Johns Hopkins University at the School of Advanced International Studies in Washington, DC. Upon completion of the Fellowship, he was reassigned to the Director of

Expeditionary Warfare, Office of the Chief of Naval Operations, as the Resource and Requirements Officer for Unmanned Aerial Vehicles.

In January 2000, Lieutenant General Robling assumed command of Marine Aircraft Group 11. In August 2001, he assumed the duties of Chief of Staff for the 3d Marine Aircraft Wing in Miramar, California. In June 2002, Lieutenant General Robling assumed the duties of Assistant Wing Commander for the 3d Marine Aircraft Wing.

In January 2003, Lieutenant General Robling deployed for Operation Iraqi Freedom. He was designated Commanding General, 3d MAW Forward in June 2003 and returned to Miramar in September 2003. In July 2004, Lieutenant General Robling assumed duty as Chief of Staff, Striking and Support Forces NATO, in Naples, Italy. In July 2006, he was assigned to serve as the Director, Strategy and Plans Division in Plans, Policy and Operations, Headquarters, U.S. Marine Corps.

In July 2007, Lieutenant General Robling assumed command of the 3d Marine Aircraft Wing, where he served until August of 2009. In September 2009, Lieutenant General Robling assumed command of the III Marine Expeditionary Force and Marine Corps Bases Japan.

Richard Gilpin



**Deputy Assistant Secretary of the Navy
(Air Programs)
Office of the Assistant Secretary of the Navy
(Research, Development and Acquisition)**

Mr. Richard Gilpin currently serves as the Deputy Assistant Secretary of the Navy (Air Programs) (DASN (Air)), where he has been assigned since April, 2011. He is the principal advisor to ASN(RD&A) on matters relating to aircraft (manned and unmanned), air-launched weapons, cruise missiles, airborne sensors, and avionics. DASN(Air) monitors and advises ASN(RD&A) on programs managed by the Naval Air Systems Command and affiliated Program Executive Offices (PEO).

Mr. Gilpin entered the Senior Executive service in 2003 and has 30 years of Federal Service. In his role as Director, Air Vehicle and Unmanned Aerial Vehicles Department, from May 2006 until April 2011, he served as senior civilian responsible for all acquisition and in service engineering related to Air Vehicle performance, structure, materials and sub systems for Naval Aviation. He acted as the principal NAVAIR and DoN spokesman/authority for air vehicle engineering matters and technologies.

From April 2003- May 2006 Mr. Gilpin held the position of Principal Assistant, Acquisition, Planning Programming and Budget Air Warfare for the Chief of Naval Operations. In this capacity he was the senior civilian advisor to the Aviation Deputy Chief of Naval Operations (CNO) on all issues related to the development of the Navy Program Objective Memorandum, Department of the Navy Strategic Planning and related issues for aviation. In addition, Mr. Gilpin stood up and served as the Chief Financial Officer/Cost Management Team leader for the Naval Aviation Enterprise, a forty billion dollar concern.

Mr. Gilpin is a career engineer with the Naval Air Systems Command. As Chief Engineer and Air Vehicle Team Leader, he led the development of the F/A-18 E/F, as well as initiated the development of the Electronic Attack variant of the F-18 and the EA-18G, while also serving as the EA-18G Program Manager. He also served as the Technical Director for the E-2 Advanced Hawkeye program.

Updated 5-11

Mr. Gilpin is a Naval Air Systems Command Associate Fellow, has a master's of science degree in systems management from the University of Southern California and bachelor's of science degree in mechanical engineering from Drexel University.

Through this tenure Mr. Gilpin has been recognized twice with Department of the Navy Superior Service Awards, and has twice been awarded the Association of Naval Aviation Edward H Heinemann Award for his contributions to Naval Aviation.



United States Navy Biography

Rear Admiral William F. "Bill" Moran **Director, Air Warfare (OPNAV N98)**

Rear Adm. Moran was born and raised in the state of New York. He is a graduate of Valley Central High School and holds a Bachelor of Science degree from the United States Naval Academy (1981) and a master's degree from the National War College (2006).

Moran is a P-3 pilot with operational tours spanning both coasts including Patrol Squadron 44, Brunswick, Maine; Patrol Squadron 45, Jacksonville, Fla.; command of Patrol Squadron 46, Whidbey Island, Wash.; and command of Patrol and Reconnaissance Wing 2, Hawaii. He has deployed to Sigonella, Sicily; Rota, Spain; Lajes Azores; Keflavik, Iceland; Misawa, Japan; Diego Garcia; Masirah, Oman; Bahrain; and, numerous detachments around the world. His other operational tours include flag lieutenant and Battle Group tactical watch officer for Commander, Carrier Group Six, Mayport, Fla., aboard USS *Forrestal* (CVA 59). Moran has served extensively as an instructor pilot in multiple operational tours, and two tours with Patrol Squadron 30, the Fleet Replacement Squadron.



Moran's shore assignments include: Patrol Wing 11, Jacksonville, Fla., as safety officer and assistant maintenance officer; the Bureau of Naval Personnel, Washington, D.C., as assistant Washington placement officer and assistant flag officer detailee; deputy executive assistant and executive assistant to Commander, U.S. Pacific Command, Camp Smith, Hawaii, from July 2000 to July 2003; deputy director, Navy staff from July 2006 until June 2007; and as executive assistant to the Chief of Naval Operations from June 2007 until August 2008. Upon selection to flag rank, Moran assumed duties as commander, Patrol and Reconnaissance Group in August 2008.

Moran served as deputy director, and currently serves as director, Air Warfare (OPNAV N98) on the staff of the Chief of Naval Operations (CNO). In this capacity, Moran is responsible for the development, programming, and budgeting of all Naval aviation warfighting requirements.

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RECORD VERSION

STATEMENT BY

MAJOR GENERAL WILLIAM T. CROSBY
PROGRAM EXECUTIVE OFFICER, AVIATION

BEFORE THE

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

ON DEPARTMENT OF DEFENSE ROTORCRAFT MODERNIZATION PROGRAMS

SECOND SESSION, 112TH CONGRESS

MARCH 27, 2012

NOT FOR PUBLICATION UNTIL RELEASED BY THE
COMMITTEE ON ARMED SERVICES

Chairman Bartlett, Representative Reyes, distinguished Members of the Subcommittee on Air and Land Forces and distinguished members of the subcommittee, I am pleased to be here today to discuss Army Aviation Modernization. I welcome this opportunity to testify before you and appreciate the tremendous and ongoing support this committee has provided to our Army and our Soldiers stationed around the world. I know you all will agree that our Soldiers have performed magnificently and our families have sacrificed much for our nation over the past ten years.

After a decade of continuous deployment and the associated stress and strain on the Army and its assigned weapon systems, and as the Army's operational posture changes, we have assessed our current situation to ensure the correct strategy is in place to successfully overcome current and future challenges.

Today we are faced with uncertain strategic and operational environments coupled with declining resources. The Army's Aviation Modernization strategy reflects the need to be able to support the current fight, set priorities, make prudent choices, and continue to modernize our Army Aviation systems in ways that provide the best force for our Nation within the resources available. We recognize that this is a tough time for our nation and share in the economic responsibility of finding new and innovative ways of acquiring and sustaining our Army Aviation weapon systems smarter, faster, more affordably and more effectively. We realize that we must take an appetite suppressant as we bridge that gap and take calculated risks in some areas.

In taking some of those risks, we also have to make sure that the impact on our Soldiers is minimal. We will adapt to the current budget realignments the best way we can and maintain an open line to our deployed forces and combat commanders. As such, we continue to modernize our airframes and tackle obsolescence and sustainment challenges. Long term sustainment is key to the logistical support of our aviation platforms.

As the Army's materiel developer of Army aircraft and weapon systems, the Program Executive Office for Aviation has taken a proactive approach to our Aviation Modernization Plan that ensures a balanced, long range approach. We recognize that

we must adapt our plan while avoiding the natural tendency to cut our investment programs to meet short term mandates. Our plan accepts risk in some modification improvements, minimizes the impacts to our industrial base by preserving our multi-year contracts, and extends the production plan by three to five years in the long term (reducing quantities in the near-term). This was done to preserve our Science & Technology (S&T) investments in a future vertical lift, maintain our path to address the deficiencies in the Scout mission area, and continue our procurement and modernization of our current platforms and our Unmanned Aircraft Systems (UAS).

Further, strategies to develop Future Vertical Lift (FVL) while sustaining the current fleet and accepting a level of risk in some current mission areas have to be considered in a balanced approach. Future Vertical Lift will have to be scalable within available resources with priority given to the utility and attack fleet.

In continuing support to our Soldiers, the latest generation of Apache, **the AH-64D Longbow Apache Block III**, will enter service this year. We are continuing our commitment to maintain the Apache fleet as the world's premier attack helicopter with our modernization strategy. The new Apaches are stronger, faster and much less constrained in extreme combat conditions. Improvements include an enhanced digital electronic engine control unit, which improves the responsiveness of the rotorcraft's twin GE T700-701D engines, along with composite main rotor blades and more powerful computer systems that even allow pilots to remotely fly unmanned aircraft. Our current Block III procurement objective will be 634 remanufactures and 56 new builds. The program is currently undergoing Initial Operational Test & Evaluation at the National Training Center in Fort Irwin, California. Modernization focus areas include the overall Block III program, an advanced crew station, advanced sensors and Aviation Survivability Equipment (ASE), advanced weapons, and improvements to the platform and sustainment. The Army is planning a multi-year contract with the Apache Block III program after a full rate production decision.

Unmanned Aircraft Systems (UAS) continues to be a capability in high demand, and we continue to respond to requests from theater for additional UAS assets. We are currently supporting a significant **Raven small UAS** surge effort, doubling Raven assets in Afghanistan. We are gearing up for the **Gray Eagle** Initial

Operational Test & Evaluation this year, and this crucial milestone will pave the way for moving that key system into full rate production. Preparations are already being made for **Manned Unmanned Systems Integration Capability (MUSIC) Exercise 2** after a very successful demonstration of the first MUSIC event at Dugway Proving Ground, Utah last September. The exercise showcased many of the advancements in interoperability and the manned-unmanned teaming community. It set the stage for future interoperability improvements to benefit our Army's deployed forces.

We recognize that in some geographic locations, such as Afghanistan, circumstances dictate the need for **Vertical Takeoff and Landing (VTOL)** capabilities. While the Shadow, with its highly accurate and sustainable Reconnaissance, Surveillance and Target Acquisition (RSTA) capability, continues to provide an integral asset to the ground commanders' battlefield awareness, there are distinct advantages to having VTOL capability in remote and difficult terrain. VTOL capability would also provide a closer match in capability between the manned and unmanned systems to expand the Soldiers' options in teaming operations. The Army is dedicated to the VTOL capability, and we are working on the deployment of three Army ARGUS A160s (AAA) to Afghanistan this summer as part of a Quick Reaction Capability.

The next generation of UAS will be marked with three capability focus areas: greater flexibility to the user, superior capability, and advanced autonomy. They will be network resident, enabling the UAS to be responsive to networked commands and broader more force pervasive requests for Reconnaissance, Surveillance and Target Acquisition and Intelligence, Surveillance and Reconnaissance (ISR), and capable of optimizing planning and usage. Current generation single payload, single sensing modularity platforms will give way to multi-spectrum, multi-sensor platforms capable of finding targets down to dismount and IED size efficiently and effectively. Lastly, those systems will have increased intelligence and autonomy on the vehicle systems to improve on the capability per person force structure. In other words, we're going to do more processing on the platforms to allow for less post-processing, exploitation and dissemination.

Our most current pioneering effort in UAS is the development of the **Ground Based Sense and Avoid (GBSAA) system**. Over the past decade, UAS have become an integral part of the United States military. However, a significant challenge hindering the ability of the U.S. military to operate, to test, and to train UAS in the U.S. National Airspace System (NAS), is the inability to comply with Federal Aviation Regulations which require the ability to “see and avoid other aircraft.” Manned aircraft see and avoid routinely, but with no pilot in the cockpit, UAS must develop an alternate means of compliance to this requirement in order to achieve the ultimate goal of routine and unfettered access to the NAS and ultimately to international airspace, which is required to maintain strategic overwatch through worldwide force protection of our UAS. Developing and validating a technological capability to “sense and avoid” will satisfy this alternate means of compliance. Significant effort and accomplishments in the development of GBSAA, as a practical solution to gain initial access to the NAS, have resulted in GBSAA providing an impending and immediate solution with significant promise to incrementally improve and ultimately be an element of the final integrated NAS access solution for UAS. The final solution involves integration with **Airborne Sense and Avoid (ABSAA) systems**. Current funding requirements will further support data collection, data analysis, safety case development, equipment procurement, and testing. Additionally, funding would provide the ability to research and develop new technologies to support incremental improvements of the system, which will ultimately allow unfettered and unrestricted airspace integration of UAS into the NAS. A need exists for a reconfigurable and deployable system, which could be utilized in a variety of other ways including U.S. border patrol and a capability to respond to national emergencies. A deployable GBSAA system would enable UAS to fly side-by-side with manned platforms using this deployable GBSAA system as the operator’s eyes in the sky.

Army Aviation OPTEMPO at its highest point ever and the Chinook is the rotary wing aircraft of choice in the OEF theatre. We are continuing to field the **CH-47F Chinook** helicopters to our units, and our tenth delivery this April will be to the 16th Combat Aviation Brigade (CAB) in Alaska. The CH-47F features an all new machined airframe, with a common avionics architecture system cockpit that meets all future force

digitized interoperability requirements, full authority digital automatic flight controls system, among many other integrated improvements. A follow on CH-47F Improved Cargo Helicopter multiyear contract (FY13-17) will allow the Army to complete modernization of its legacy Army National Guard/Army Reserve CH-47D Chinook Fleet with a 10.1% savings (~\$373 Million) in procurement cost. With 83% of the Army's Chinook fleet originally manufactured in the 1960s, replacing these aircraft at a reduced procurement cost is a prudent course of action. We have also streamlined the modernization process and charged one product office to manage all modernization efforts for the Chinook helicopter fleet such as replacing the floor with an integrated roller system, implementation of Condition Based Maintenance tools, development of advanced rotor blade configuration, avionics upgrades, hostile fire detection and other protection systems. **The Cargo On/Off Load System (COOLS)** replaces the current floor on the CH-47F, and significantly reduces the workload for aircrews and allows rapid, in flight re-configuration to support a wide range of missions. Flight testing will take place Summer 2012 and these COOLS kits will be fielded to units to support upcoming deployments. The full rate production decision will be made in the 1st quarter, FY13. The Army celebrated the Chinook's 50th anniversary last September, exactly 50 years since the Chinook's first flight. This milestone speaks volumes about the aircraft's proven relevance and capabilities as the Army's only heavy lift helicopter and continues to be vital to Overseas Contingency Operations (OCO) and our nation's Homeland Security needs.

Modernization efforts of the Army's **Utility UH-60M helicopters** continue and are focused on three specific efforts: our continuous modernization of the UH/HH-60M fleet, the digitization of the UH-60L cockpit, and completing the development and testing of fly-by-wire (FBW) technology this year. Currently, 331 UH-60Ms and 93 HH60Ms have been delivered so far. The UH-60M provides extensive capability beyond the legacy UH-60A/L platforms in that it provides a fully integrated glass cockpit that improves situational awareness and reduces operator work load in a complex combat environment through digital moving map displays, multi-band radio systems and improved aircraft survivability equipment. The system's reliability, availability and maintainability have also evolved with the integration of a real-time vehicle health

management system reducing overall maintenance and sustainment costs. The Army's current procurement objective for the UH-60M Baseline is 1,367 aircraft. To preserve our multi-years with this system, the Army plans to reduce the number of UH-60Ms purchased in FY14-18 and extend the planned procurement through FY26. The Army has incorporated the flexibility to procure lower annual quantities in the new multi-year contract currently in negotiation.

Production of our **UH-72A Lakotas** remains on schedule and cost with 209 of 345 delivered to the Army. Serving as the Army's newest helicopter, the Lakota supports our Active Army and National Guard missions. The Security & Support Battalion Mission Equipment Package (S&S MEP), the latest LUH configuration adds an Electro-Optical / Infra-red Sensor, a searchlight, and data collection, display and downlink systems and supports counter-drug, law enforcement, border patrol, and Homeland Security missions across the U.S., Hawaii and in Puerto Rico. The LUH program has been touted as a model acquisition program throughout the Army.

Under the Utility Helicopters Project Office, effort is also underway on the **Improved Turbine Engine Program (ITEP)** which will develop the next generation engine bringing reduced fuel usage, increased performance, improved reliability and lower maintenance. It's use will provide significant fuel savings for current UH-60 Black Hawks and AH-64 Apaches with a reduction in cost of operations and dependence on oil, improvement in range, endurance and on-station (loiter) aircraft capability, and will save lives now lost moving and protecting fuel on the battlefield and lightens the logistics load. Leveraging today's ITEP investment will provide Future Vertical Lift platforms with significantly increased capabilities that will meet the warfighters' unique mission requirements. This translates to a 25% specific fuel consumption decrease, 35% production and maintenance cost decrease and will incorporate a Condition Based Maintenance plus (CBM+) package, 65% horsepower to weight increase with 20% engine life design increase. Engine level demonstrations are slated to begin in FY12. Our current procurement plan is to have Low Rate Initial Production in FY19. The ITEP is also aligned with the Army Operational Power and Energy Strategy, the DoD Operational Energy Strategy, and the National Defense Strategy.

The Army is undertaking key modernization efforts in the Project Office for Aviation Systems that include **Automated Aviation Logistics (AAL)** and **Degraded Visual Environment (DVE)**. AAL will replace the Unit Level Logistics System-Aviation (Enhanced) and the Unmanned Aircraft Systems-Initiative (UAS-I) with a best of breed, state of the art family of systems for all manned and unmanned aircraft in both conventional and special operations tactical units. The end result will be game changing capabilities for net-centric Aviation maintenance, supply, operations, safety, training, and readiness information in both connected and disconnected environments; seamless interfaces to the Global Combat Support System-Army (GCSS-Army) & the logistics enterprise; and elimination of today's knowledge gaps which force commanders and maintainers to make decisions based on incomplete and anecdotal information. AAL's Aircraft Notebook (ACN), Aviation Data Exploitation Capability (ADEC), and Aviation Logistics Enterprise-Platform (ALE-P) are scheduled to begin fielding in FY14 in concert with GCSS-Army.

Degraded Visual Environment (DVE) is an effort to mature and acquire obscurant penetration sensor technologies for rotary wing flight operations. Army aircrews often encounter flight conditions that severely restrict the flight crews' visibility due to brownout, whiteout, or other natural or manmade atmospheric obscurants. DVE technologies will provide aircrews with real-time visual information of the terrain and obstacles encountered during combat and training flight operations. Potential DVE solutions may include a combination of both active and passive sensor technologies, enhanced flight control systems, and the integration of flight symbology. The integration of obscurant penetrating technologies on the Army's rotary wing fleet will both save lives and resources while increasing combat capabilities.

Army Aviation **Aircraft Survivability Equipment (ASE)** modernization efforts continue to focus on detecting and defeating highly proliferated Man-portable Air Defense Systems (MANPADS) and small arms munitions, the greatest threats to the preponderance of the Army Aviation fleet. **The Common Missile Warning System (CMWS)** detects infrared-seeking missiles and protects aircrews and passengers by employing expendable countermeasures. CMWS is also being upgraded to detect unguided small arms fire to provide better threat situational understanding to Army

aircrews. **The Advanced Threat Infrared Countermeasures (ATIRCM) system** provides laser-based countermeasure protection to select aircraft deployed in Afghanistan and **the Common Infrared Countermeasures (CIRCM) system** will provide laser-based countermeasure protection to the greater Army Aviation fleet as well as US Marine Corps assault platforms. As the National Military Strategy shifts focus to the Asia-Pacific Theater, the Army is readdressing the significant capability gap against Radio Frequency (RF)-guided threats. These multiple ASE modernization efforts are being integrated to optimize aircrew situational understanding and enable off-boarding of geo-located threat data to inform route planning and operational commanders.

Any further funding decrements to ASE programs will jeopardize aircrew and passenger survivability against IR-seeking missiles and small arms fire. While the Army has no procurement for a new Radar Warning Receiver (RWR), the ASE program office is seeking to leverage US Navy RWR modernization efforts with limited Army RDTE funds to replace the current RWR, which is wholly inadequate for employment in the RF threat-heavy Asia-Pacific Theater. Further funding cuts would also hamper efforts to integrate ASE to provide comprehensive threat situational understanding, coordinated countermeasures, and off-boarding of geo-located threat data to air and ground operational commanders.

The Army senior leadership recognized the magnitude of work required to acquire, field, sustain, and modernize the Army's Fixed Wing fleet and on October 2011, we stood up our newest Project Office for Fixed Wing aircraft. This office is pursuing several aircraft acquisitions, some of which includes the modification of six new C12V1's (Hawker Beech B-200 series aircraft) with the latest military communications, navigation, surveillance, and aircraft survivability equipment for worldwide deployability. There is also ongoing procurement to provide the Golden Knights with three new Twin Otter 400 aircraft to support their recruiting and parachute demonstration missions. While working to acquire new aircraft and retire the Army's older fleet models, the office will perform a series of modifications to ensure the Army's current fleet continues to operate in accordance with all civil and military requirements.

The venerable **OH-58D Kiowa Warrior** has been maxed out over the years and continues to be the aircraft of choice with our ground commanders as well as the aircraft with the highest op-tempo. We continue to push capability improvements to the field to address Operational Needs, reduce aircraft weight, enhance maintainability, improve safety, and address obsolescence and weight reduction, part of which is the **Cockpit and Sensor Upgrade Program (CASUP)/OH-58F initiative**.

CASUP is designed to address avionics obsolescence inherent to an aircraft that has not undergone a comprehensive, modernization effort since the designation modification from the unarmed OH-58D Army Helicopter Improvement Program (AHIP) to the armed OH-58D Kiowa Warrior in 1990. Obsolescence will be addressed through modernization interoperability, Aircraft Survivability Equipment (ASE), armament and lethality, sensors, digital cockpit display/ processor/controls, navigation guidance, and communication / identification. CASUP's capability increase is largely centered on the Nose-Mounted Sensor (NMS), which will replace the current, and obsolete, Mast-Mounted Sensor (MMS). Additionally, CASUP will fully integrate several aircraft systems that are currently federated, redesign and replace the entire aircraft wiring harness, and add a capability to integrate future digital weapons systems. CASUP/OH-58F First Unit Equipped (FUE) is scheduled for 2016 and will modify all OH-58D aircraft to the new configuration. Work began on the first series of production and engineering aircraft in spring 2011. Pre-flight, ground test runs are scheduled in summer 2012, with First Flight of the CASUP/OH-58F configuration occurring in early 2013. The Army plans to convert all OH-58D aircraft to the OH-58F configuration through the CASUP production line. Squadron fieldings will take place from FY16 through FY21.

Fielded fleet upgrade efforts are on going to reduce weight, address obsolescence, improve reliability, and increasing capability. These efforts include: **Manned-Unmanned Teaming (MUM-T)** which allows the OH-58D to view video from UAS and other aircraft in real time; analyzing options for the .50 Cal Machine Gun to provides a more reliable weapon system over the existing M3P gun; Lightweight Floor Armor which increases the safety of the aircrews; **the Common Missile Warning System (CMWS)** which increases the aircraft and crew's survivability against surface-to-air threats; and the **Health and Usage Monitoring System (HUMS)** which increases safety and

reliability through the monitoring of critical aircraft systems and components. The Army is fielding the reduced weight missile launcher, the composite weapons pylon, and the light weight multi-function displays. In addition, the Army is fielding the single channel **Full Authority Digital Engine Control (FADEC)** to address safety. The OH-58D continues to maintain the highest operational tempo of any Army Aviation asset.

An analysis of alternatives (AoA) validated the need for manned reconnaissance and recognized the benefit of Manned/Unmanned Teaming as it applies to closing the capability gaps we believe we will see in the future. The analysis clearly states that the only way to completely address those gaps is with a new-start aircraft development program. Our assessment is that a new-start program is too costly.

As we look to the Kiowa Warrior future and bridge to the **Armed Aerial Scout (AAS)**, we look to ourselves and ask, what is that new capability? With the current budget environment, there is no way we are going to be able to implement all the new capabilities for the future of the entire aviation fleet plus a new start AAS right now. So we have developed a strategy that states: take risk in the scout area and focus on that new Future Vertical Lift (FVL) capability down the road with an Aim Point of 2030.

Our path forward with the AAS does not involve a fly-off, but rather a demonstration which will enable us to make an informed decision on a path ahead and to find a materiel solution to replace or extend the current fleet of our aging OH-58D Kiowa Warrior helicopters. The AAS demo will clearly define whether we execute a Service Life Extension Program (SLEP) of the OH-58 aircraft, consistent with what we have done to the other platforms, or if we pursue an alternative material solution option that represents a medium risk program with achievable and affordable requirements within the current and future fiscal environment.

The funding is in place, awaiting approval to execute the demonstration from the Defense Acquisition Executive. The proposed April 2012 demonstration schedule was based on receiving authorization NLT December 2011. Since authorization was not provided in December 2011, the schedule has shifted to late spring/early summer depending upon the date authorization is received. A draft Acquisition Decision Memorandum (ADM) has been written and is currently being reviewed with OSD AT&L.

Upon receipt of the revised ADM, the Request for Information (RFI) will be released to industry and will include a timeline for submission of written RFI responses and execution of the demonstration. It is anticipated that the slip will not impact the position in the POM but the decision point for the Army. The Army will continue to execute the current programs (CASUP and planning for a Service Life Extension Program) at their resourced levels until such a time a decision is made by the Army. If the determination offers an affordable and capable alternative, resourcing of the resultant program will be accomplished using existing program funds within the aviation portfolio. The Analysis of Alternatives recommended the AAS be capable of hovering at 6,000 feet above ground level at 95 degrees Fahrenheit Hover Out of Ground Effect (HOGE) ("High/Hot"); 550 KM Range; one hour station time at 212 KM; and 135 knots Airspeed.

As the budgets come down, we recognize that it will be difficult to resource Army Aviation at the same level in the future. We continue to successfully modify, upgrade, and remanufacture current existing platforms to extend the life of our aircraft and keep our aircrews safe. Even with all of the great work we are doing upgrading and supporting the current fleet, now is the time to invest in the S&T required to develop the future fleet. We are still flying third generation vertical lift platforms designed during the Vietnam War era, nearly 50 years ago. Our current fleet will not last forever and there are bounds to our ability to upgrade current designs to meet future needs. The requirement for vertical lift will not decrease in the current or future military engagements compounded at times with extensive humanitarian assistance and disaster relief efforts.

Army Aviation is part of an early stage Science and Technology effort by the Pentagon and the U.S. Army to engineer, build and deliver a next-generation helicopter with vastly improved avionics, electronics, range, speed, propulsion, survivability, operating density altitudes and payload capacity. The Army-led **Joint Future Vertical Lift (JFVL)** program is a broadly-scoped Pentagon effort, including input, officials and working group members from OSD, other military services, Coast Guard, Special Operations Command and NASA, among others.

The focus of JFVL is to get at the three major tenets: improve the performance, improve the survivability and significantly reduce the operating cost. While the JFVL

program includes the exploration of light, medium and heavy lift helicopter variants, the effort will initially focus on medium lift options. The next-generation aircraft will have to be a whole lot less expensive to operate than the current fleet.

Building a new aircraft from the ground up is part of an overall strategic effort to harness the best new technologies, allow for the platform to be upgraded as new technologies emerge, integrate systems into a common architecture and, perhaps most of all, drive down costs. Affordability is the utmost priority with the JFVL effort.

Development and fielding of the next-generation family of aircraft depends on the capabilities of the U.S. technology base to design, mature, deliver, and sustain these aircraft. U.S. vertical lift industry members, using independent research and development funding, can aid technology development in this sector. This initiative provides uncommon unity of effort and focus of both DoD and industry, reducing redundancy and collaborating on identified areas of greatest need. The publication of the DoD Strategic Plan for Future Vertical Lift Aircraft focuses on resources on high-priority areas.

Since the delivery of the Report to Congress, significant and concrete activities continue to evolve. The Army, as the lead service for this Joint effort, is heading the development of a Joint Initial Capabilities Document with a target release date of spring 2012 for staffing. This effort is informed by a design tradeoff analysis being conducted by a Joint team of DoD aircraft preliminary designers.

To complement the DoD concept design effort, the Army has awarded four concept trades and analysis (CT&A) contracts to Boeing, Sikorsky Aircraft, the Bell-Boeing Team, and the AVX Aircraft Co. These four efforts will perform design trades using the same set of attributes as those used by the DoD team, to ensure that both industry and the government understand the potential solution space to address the capability gaps identified in the Capabilities-Based Assessment (CBA) process.

In addition, the Army has focused its Aviation S&T effort toward a Joint Vertical Lift Technology Demonstrator program, with plans to develop two flying demonstrators for first flights in the 2017 timeframe. This involves a major funding commitment for Aviation S&T. At the end of the CT&A phase, contracts will be awarded to build actual

flying demonstrator platforms to mature the critical technology enablers defined during the CT&A effort.

These will be the first DoD vertical lift demonstrators developed since the Army/NASA XV-15 in 1977. A similar effort, focused on the mission systems for the next-generation vertical lift platforms, is being defined for initiation in FY12. Mission equipment demonstrators will be integrated into the platform demonstrators, with a targeted first flight of the complete demonstrator air vehicle in the FY19 timeframe.

Finally, the Army's Program Executive Office (PEO) Aviation and the Navy's PEO Air ASW, Assault and Special Mission Programs are collaborating to develop an acquisition strategy for a potential new, joint program to develop and field the next generation of vertical lift aviation in the 2030 timeframe. Future Vertical Lift aircraft is an integral part of our long range plan and part of our balanced approach to maintain our investments. 2030 is the aim point for a new system to replace our aging fleets, and our initial effort will be focused on our attack and utility mission areas, which comprises about 75% of our current fleet. Science and Technology investments today in subsystems like the Improved Turbine Engine program (ITEP) and the other identified enabling technologies are critical to maintain our planned schedule. Additionally, we continue to execute our multi-year contracts which have gained our taxpayers significant savings over the prices that would have resulted had the Army awarded single year contracts.

Conclusion

Army Aviation programs and their foundations are solid and we have a modernization strategy for the future. Our aircraft and equipment are the best America can provide and have displayed readiness and flying hour OPTEMPO rates that far surpassed expectations. More importantly, we have successfully answered the calls to integrate our capabilities with various combined arms teams, sustaining forces and joint agencies.

With the current resource environment, we are going to have to take the best solution we can with the best potential for success without compromising safety. Identify what those impacts are early, and determine the best course of action to give our Soldiers what they need at a price we can afford. As our Army cares for the aging

fleet, we will continue to support the development and execution of a new investment strategy that will provide for new platforms ready to field in the 2025 timeframe and beyond.

The credit for Army Aviation's success and continued support from senior leaders belongs to the Soldiers on the ground who will always be our utmost priority. Our relationship with the ground force is the best that it has ever been in army aviation's history. Achieving such a high level of professional excellence took years of hard work by a new generation of air and ground warriors who fully respect the warfighting accomplishments of each other. It is our dedication to supporting the ground commander that helped to establish a collaborative environment among the various members of the aviation enterprise over the past several years and will serve as the foundation for our future success. Whatever we do, we cannot allow our tremendous relationship in supporting the ground force commander to degrade. It is this strong relationship that will be the lens by which we look towards the future and the benchmark by which we will measure success. As we move ahead, Army Aviation will continue to ensure that we reduce the burden on the Soldier.

The next several years will be pivotal for Army Aviation. The resources provided to the Army to conduct Aviation operations while modernizing and posture for the next generation of aviation capabilities will determine the Army's ability to continue to accomplish its mission and to be postured to meet future commitments. To execute these plans, we need your continued leadership and support to provide full, timely, and sustained funding so we will be ready for current and future challenges.

I look forward to your questions.

Major General William T. Crosby
Program Executive Office, Aviation

MG William T. (Tim) Crosby assumed duties as the Program Executive Officer, Aviation on 12 December 2008.

MG Crosby entered the Army as a Field Artillery Officer after graduating from The Citadel in 1979 and was assigned to the 24th Infantry Division serving as Fire Support Team Chief, Battalion Fire Direction Officer, Special Weapons Officer, and Battery Executive Officer.

Following this assignment, MG Crosby entered flight school at Fort Rucker, AL where he was awarded his aviator wings in May of 1982. Upon completion of flight school, MG Crosby attended the CH-47 Transition and was assigned to the 205th Aviation Company in Mainz Finthen, West Germany where he served in successive positions as Flight Platoon Leader, Executive Officer, and Operations Officer.

MG Crosby then returned to Fort Rucker to attend the Aviation Officer Advanced Course, was awarded a Research and Development Functional Area, and was assigned to the U.S. Army Aviation Development Test Activity in January of 1986 conducting developmental flight testing on CH-47, UH-60, and fixed-wing aircraft.

In February of 1990, MG Crosby returned to Europe to command the VIIth Corps CH-47 unit and deployed his unit to Southwest Asia to participate in Operations Desert Shield and Storm. He commanded the unit for just under two years followed by an assignment as a battalion executive officer. Following staff college, MG Crosby was assigned to PMO Comanche in 1993, where he held the positions of Logistics Management Officer, Assistant Program Manager (APM) for Training and Simulation, APM for MANPRINT, and APM for Test and Evaluation.

MG Crosby left Comanche in June of 1996 to serve as a Weapons System Program Evaluator in the J8 Directorate of the Office of the Joint Chiefs of Staff. After a two year tour on the Joint Staff, he was assigned to serve as the first Product Manager for the Improved Cargo Helicopter Program, now known as the CH-47F.

MG Crosby attended the Air War College at Maxwell Air Force Base and earned a Masters Degree in International and Strategic Studies. While at War College, he was selected for promotion to Colonel and was selected to be the Project Manager for the Army's Cargo Helicopter Program.

MG Crosby completed his tour of duty as the Army's Cargo Helicopter Project Manager and conducted a change of charter on 24 August 2006. He was immediately reassigned as the interim Project Manager for the newly formed Armed Scout Helicopter Program Office on 25 August 2006 and remained in that position until the command slated Armed Scout Helicopter Project Manager arrived on 17 October 2006. He then served as the PM Reset charged with integrating the effort to Preset and Reset the aircraft going to and returning from combat deployment. In May 2007, MG Crosby became the Deputy Program Executive Officer, Aviation.

He was promoted to the rank of major general in February 2011. MG Crosby is married to the former Janice McIntosh from Sumter, South Carolina. They have three children: Rebecca, Sara and Will.

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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
UNITED STATES 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

SUBJECT: Air Force Rotorcraft Programs

COMBINED STATEMENT OF: Major General Robert C. Kane
Director of Global Reach Programs, Office of the
Assistant Secretary of the Air Force (Acquisition)

Major General Noel T. Jones
Director, Operational Capability Requirements
DCS, Operations, Plans & Requirements

March 27, 2012

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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
UNITED STATES HOUSE OF REPRESENTATIVES

Introduction

Chairman Bartlett, Ranking Member Reyes, and distinguished members of the subcommittee, thank you for calling this hearing, and for the opportunity to provide you with an update on Air Force rotorcraft modernization efforts important to our Air Force and to the Nation. Air Force rotary wing assets are critical to the mission of the Air Force and provide worldwide support to Combatant Commanders. The HH-60G supports the Service's Core Function of Personnel Recovery. Additionally, the UH-1N provides security for Nuclear Operations while also ensuring continuity of government and continuity of operations in the National Capital Region. Another H-1 variant, the TH-1H, provides a modern platform for the rotary wing track of Air Force undergraduate pilot training. Finally, the CV-22 provides US Special Operations Command with a unique long-range vertical lift capability. The Air Force is dedicated to sustaining our capabilities and modernizing as required to ensure we meet the needs of the country.

Combat Search and Rescue (HH-60G)

Air Force Rescue Forces recover isolated personnel in contested areas, marginal weather, and during very-low illumination. The Air Force makes a significant investment to train and equip dedicated Rescue Forces capable of providing Personnel Recovery in support of the Joint Force. Since September 11, 2001, our HH-60G crews have recovered isolated personnel in hostile enemy territory and have repeatedly landed in contested areas to recover injured American and Coalition Soldiers, Sailors, Airmen and Marines. They have also assisted with casualty evacuation (CASEVAC), medical evacuations (MEDEVAC), special operations support, and humanitarian relief missions. Over 12,000 American, coalition, and civilian lives have been affected by the actions of our heroic Rescue Forces over the past 10 years.

Throughout 2011, Air Force Rescue Forces remained fully engaged in Personnel Recovery efforts across the globe. They operated in Afghanistan, Iraq, and in support of operations in Libya. HH-60G crews performed 16 Combat Search and Rescue (CSAR) missions and 2,157

CASEVAC missions. Additionally, Rescue Forces performed tsunami humanitarian relief operations on the Japanese main island of Honshu.

The HH-60G Pave Hawk is a low supply/high demand asset and operated throughout 2011 at a significantly higher deployed utilization rate than over previous years. The HH-60G fleet contains only 99 of the original 112 aircraft program of record, of which only 93 are currently flyable due to unscheduled depot maintenance. Major structural cracks have been found on 66 of the 99 aircraft and 47 aircraft have sustained battle damage in the last two years. These impacts have led to increased aircraft down time due to unscheduled depot maintenance.

Aircraft availability remains a top concern for Air Force Personnel Recovery leadership. Ongoing modification programs are keeping the HH-60G a viable combat search and rescue (CSAR) weapon system until the Air Force's replacement program is complete. The modifications address sustainment issues, safety features, defensive systems, and avionics upgrades that allow the HH-60G to continue operations in a joint/multi-national environment under austere combat conditions.

Aircraft survivability remains a top priority for the Air Force. The HH-60G is currently equipped with infrared/radar missile warning systems and countermeasure dispensers. Additionally, the HH-60G has an infrared missile jammer. In FY12, with significant help from the Navy, the Air Force initiated a program to update its onboard sensors on our deployed aircraft to include a hostile fire indicator (HFI) capability. This capability provides indications of unguided weapons such as some types of bullets and rocket propelled grenades. HFI is currently installed on aircraft deployed to Afghanistan and will be installed on the remaining aircraft as they deploy.

Another survivability concern for our HH-60Gs is operating in degraded visual environments (DVE), especially during landings and take offs in dusty areas. The Air Force is finalizing its testing of an improved altitude hold and hover system that will provide the capability to fly a coupled approach to landing. Additionally, the Air Force is participating in a joint effort that is researching technologies that will provide pilots the ability to "see-through" dust during landings and provide a digitized picture of the landing zone in the cockpit.

The Air Force is procuring replacement rotary wing aircraft based upon currently fielded CSAR capabilities. Two programs address the immediate and long-term needs of the Air Force: HH-60 Operational Loss Replacement (OLR) and the Combat Rescue Helicopter (CRH) program.

The OLR program is a short-term fix to address current availability issues and provide combat capable aircraft to the combatant commanders. The HH-60G is a UH-60A/L with over 25 years of modifications and an off-the-shelf replacement does not exist. The UH-60L is no longer in production and has been replaced by the more modern digitally based UH-60M.

OLR uses an incremental acquisition strategy to deliver replacement aircraft to the warfighter as rapidly as possible. Baseline aircraft are procured using an existing US Army contract. The initial three UH-60M aircraft receive minimal modifications and deliver to a non-combat coded squadron, freeing up three combat capable HH-60Gs to deployed squadrons. The first two aircraft were delivered in September 2011 and the third is scheduled for May 2012.

The additional OLR aircraft will be modified to the current HH-60G configuration. The Air Force plans to utilize existing modifications to limit development and test which reduces schedule risk. Non-recurring engineering will combine several existing modifications into one streamlined modification. The fourth OLR aircraft is scheduled to begin receiving modifications by the end of 2012 with an anticipated delivery in mid to late 2013.

The Air Force's commitment to Personnel Recovery is rooted in our resolve to bring every one of our men and women home from combat, regardless of Service. Modernizing the HH-60G fleet preserves our high end rescue capability to meet Combatant Commanders requirements.

The Combat Rescue Helicopter (CRH) program (formerly known as HH-60 Recapitalization) is a full and open competition intended to replace the entire CSAR fleet. The Joint Staff approved the requirements in July 2010. The program will procure an existing aircraft configured by the contractor with non-developmental mission equipment to meet the approved requirements. A request for proposal is scheduled for May 2012 with a contract award planned for the 3rd Quarter

of 2013. The FY13 PB supports the procurement of the initial two aircraft and the initiation of the required integration. At Initial Operating Capability (IOC) in FY18, the Air Force will have a minimum of four training aircraft and four operational aircraft.

Nuclear Security and Continuity of Government (UH-1N)

The UH-1N “Huey” is a versatile helicopter whose service in our Air Force has spanned five decades. Entering the USAF inventory in 1970 for its search and rescue capabilities, the UH-1N mission set has expanded and transformed over the years to include nuclear security support, continuity of government/continuity of operations (COG/COOP), Foreign Internal Defense support, formal training, senior leader airlift, test/range support, and survival/evasion/resistance/escape (SERE) training. The UH-1N helicopters assigned at the following locations: Maryland, Wyoming, Montana, North Dakota, Washington, Florida, New Mexico, and Japan.

The two primary missions conducted by the UH-1N are nuclear security support and COG/COOP. The nuclear security support mission includes emergency security response and nuclear convoy support. During an emergency security response mission, UH-1N helicopters provide timely transport of a tactical response force to defend/protect a missile site. Once at the site, the helicopters conduct overhead surveillance and communications support for the tactical response force. Nuclear convoy support missions require the UH-1Ns to transport an airborne convoy response force, provide convoy communications support, and conduct overhead surveillance to ensure the security of the nuclear convoy.

The Air Force is also tasked under three operations plans for national level COG/COOP missions. These National Capital Region emergency evacuation plans require 27 UH-1Ns to ensure enough aircraft are on alert 24 hours a day, 7 days per week, 365 days per year, while still addressing scheduled and unscheduled maintenance, training, senior leader airlift, MEDEVAC, search and rescue, and Defense Support of Civil Authorities requirements. The 1st Helicopter

Squadron, at Andrews AFB, MD, currently has 19 UH-1N helicopters to support the COG/COOP missions.

In FY 2009, the Air Force began the Common Vertical Lift Support Platform (CVLSP) program to replace the 62 UH-1N helicopters with 93 non-developmental, off-the-shelf helicopters with mission-essential speed, range, payload, endurance, and survivability capabilities. The modernization effort focused on addressing the capability gaps that had developed between the UH-1N and its assigned missions during the past 40 years. Due to fiscal constraints, the FY 2013 President's Budget eliminates funding for the CVLSP platform, allowing the Air Force to take a strategic pause and explore more cost-effective strategies to address the nuclear security and COG/COOP mission capability gaps.

While the missions UH-1N helicopters support have changed and expanded over the past 40 years, the helicopter has not. Today, we ask our UH-1N pilots to fly an aircraft at night with night vision goggles, but without the benefit of a night vision compatible cockpit and without crashworthy seats. Several UH-1N safety and obsolescence modifications, including the installation of night vision compatible cockpits and crashworthy seats, are being considered to address these near term issues. Additionally, upgrades to training systems that will decrease the UH-1N flying hour requirements, while still ensuring a high readiness for the COG/COOP missions, will allow the UH-1N fleet to more effectively conduct their missions.

In the long-term, the UH-1Ns are entering uncharted territory in terms of their age, much like the KC-135 fleet. There is still a validated requirement to replace the UH-1N fleet, which does not meet the requirements of the DoD Nuclear Weapons Security Manual 5210.41M, and is deficient in numbers and performance for the COG/COOP mission. Specifically, the UH-1N lacks night all-weather capability, and crew command and control situational awareness, in addition to the aforementioned lack of adequate carrying capacity, speed, range, endurance, and survivability. Additionally, the UH-1N has its sustainment and obsolescence issues. Until a replacement is possible, the USAF is exploring a number of strategies to mitigate the capability gaps in the nuclear security and COG/COOP mission areas. These include revised tactics, techniques, and procedures; sustainment modifications to UH-1N aircraft; and increasing force structure through

excess defense articles. In fact, the Air Force is already pursuing the transfer of up to 22 UH-1Ns from the United States Marine Corps between FY 2012 and FY 2014.

Training (TH-1H)

The TH-1H, a modernized version of the UH-1H, is used by the Air Force for its undergraduate helicopter pilot training track conducted at Fort Rucker, Alabama. In modifying a UH-1H to the TH-1H or “Huey II” configuration, the aircraft receives new main and tail rotors, drive train, tail boom, and avionics as well as upgraded engines. When the modification program is complete in late 2013, the Air Force will have a fleet of 28 TH-1H helicopters that will provide 20 years of usable life for rotary wing pilot training. The TH-1H provides a cost effective solution for Air Force rotary wing pilot training requirements and ensures graduates are well prepared for assignment to operational systems.

Special Operations (CV-22)

Air Force Special Operations Command (AFSOC) uses the CV-22 Osprey’s unique long range, speed, and vertical take-off and landing (VTOL) characteristics to provide US Special Operations Command warfighters with specialized air mobility. The Air Force Doctrine Document 1 defines specialized air mobility as “the conduct of rapid, global infiltration, exfiltration, and resupply of personnel, equipment, and materiel using specialized systems and tactics. These missions may be clandestine, low visibility, or overt and through hostile, denied, or politically sensitive airspace.” The benefits of long range VTOL were demonstrated on June 1, 2010 in Afghanistan, when two CV-22s conducted an 800-mile round trip combat search and rescue mission when severe dust storms and mountain ranges sidelined all other aircraft. The CV-22s flew over the mountain range and through very low visibility to recover the crew and passengers in less than four hours.

The CV-22 is worldwide deployable and has deployed in support of Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF) and other contingencies. One AFSOC squadron is currently supporting operations in Afghanistan. In order to successfully meet the CV-22

combat and training mission taskings, the Air Force continues to fully support the program of record. The current CV-22 fleet stands at 23 aircraft with the final buy scheduled in FY14. Declaration of full operational capability will be made following the delivery of the last CV-22 in FY16.

The Joint V-22 Program Office is developing improvements to CV-22's capabilities and is focused on improving the aircraft's reliability, availability, and reducing operating costs. Improvements are currently being implemented to increase aircraft readiness. Many of these efforts are promising mean time between failure improvements of 100% or more. Particular emphasis is being placed on improving CV-22 engine time-on-wing. These development efforts will address sand ingestion problems that severely degrade engine performance and necessitate costly engine removals and repairs, a particular problem for the CV-22 which has been operating and training in harsh desert environments.

Improvements to the CV-22 are being made in block increments and each block includes a number of modification upgrades installed as they become available. Block 10/B retrofit modifications are underway to bring the oldest CV-22s to the common baseline configuration. Production CV-22s now include some of the upgrades associated with the Block 20/C configuration (e.g. line of site communications modification and the MV-22 Block C modifications). Initiated in FY 2011, the Block 20 retrofit modification program will begin retrofitting CV-22s with modifications that will improve operational safety, suitability, and effectiveness; correct deficiencies identified in testing and operations; improve reliability/maintainability; and enhance self-deployment capabilities.

Given the CV-22 mission, survivability is an important consideration. The CV-22 Block 10/B aircraft contain an advanced directed infrared countermeasure (DIRCM) system, a suite of integrated radio frequency countermeasures (SIRFC) that detects and jams radio frequency weapons, missile warning capability, and chaff and flare dispensers. SIRFC upgrades, which increase jamming effectiveness, are being tested as part of the CV-22 Block 20/C modifications. Additionally, helmet mounted displays, which assist with situational awareness in degraded visual environment, and main landing gear fire suppression system are in development. Future

planned survivability modification efforts include DIRCM upgrades, to include hostile fire indication (HFI) capability.

Future modifications and improvements to the CV-22 will make the aircraft even more reliable, productive, and cost-effective; ensuring AFSOC's long range VTOL capability is available and able to provide specialized air mobility when required.

Closing

In FY13, two-thirds of the Air Force's rotary wing platforms will be in some form of modernization. CV-22s are reaching the end of their planned procurement program, while still upgrading their systems to ensure USSOCOM has a transformational long-range, vertical lift asset. Additionally, the Combat Rescue Helicopter program is scheduled to release its request for proposal this year to replace the entire CSAR fleet. Finally, the Air Force continues to participate in the DoD-wide Future Vertical Lift effort to ensure a joint roadmap informs future modernization efforts. While fiscal constraints may have required us to reassess the timing of some rotary wing modernization efforts, the Air Force's commitment to rotary wing modernization remains strong.



BIOGRAPHY

UNITED STATES AIR FORCE

MAJOR GENERAL ROBERT C. KANE

Maj. Gen. Robert C. Kane is Director, Global Reach Programs, Office of the Assistant Secretary of the Air Force for Acquisition, Headquarters U.S. Air Force, Washington, D.C. As the capability director, General Kane is responsible to the Air Force acquisition executive for airlift, air refueling, training and special operations programs.

General Kane entered the Air Force in 1980 after receiving his commission through the ROTC program at Grove City College, Pa. He has served in Turkey, Korea, Germany and Iraq in a wide variety of operational and staff assignments, including commands at the squadron, group, wing and center levels. As Commander of the 86th Airlift Wing and Kaiserslautern Military Community, he was instrumental in leading the Ramstein community to win the 2006 Commander in Chief Annual Award for Installation Excellence. Finally, during a 2009 deployment, he was the Commanding General, Coalition Air Force Transition Team, Baghdad, Iraq, responsible for coalition efforts to rebuild the Iraqi air force.



General Kane is a command pilot with more than 4,200 hours in the A/C-208, Mi-17, C-130, C-21, KC-135, C-37, C-32, VC-137, C-12, C-141, T-37 and T-38.

EDUCATION

1979 Bachelor of Science degree in chemistry, Grove City College, Pa.
 1985 Master of Science degree in systems management, University of Southern California, Los Angeles
 1985 Squadron Officer School, Maxwell AFB, Ala.
 1988 Air Command and Staff College, by correspondence
 1997 Air War College, Maxwell AFB, Ala.
 2005 Center for Creative Leadership, San Diego, CA
 2008 Joint Force Air Component Commander Course, Maxwell AFB, Ala.

ASSIGNMENTS

1. February 1980 - January 1981, student, undergraduate pilot training, Columbus AFB, Miss.
2. January 1981 - May 1983, T-37 instructor pilot, 37th Flying Training Squadron, Columbus AFB, Miss.
3. May 1983 - September 1986, deputy detachment commander, Accelerated Copilot Enrichment Program; T-37 instructor pilot and flight examiner, Pease AFB, N.H.
4. September 1986 - May 1989, C-141 instructor pilot, squadron executive officer and consolidated command post controller, 20th Airlift Squadron and 437th Airlift Wing, Charleston AFB, S.C.

5. May 1989 - May 1991, aide-de-camp, C-12 instructor pilot and Chief of Plans Branch, U.S. Logistics Group, Ankara, Turkey
6. June 1991 - May 1993, Chief, Government Affairs Branch; war and contingency planner; and Headquarters U.S. Air Force presidential advance agent, Military Airlift and Air Mobility Command, Scott AFB, Ill.
7. May 1993 - June 1996, legislative liaison, Commander-in-Chief's Initiative and Legislative Affairs Group, U.S. Transportation Command, Scott AFB, Ill.
8. June 1996 - June 1997, student, Air War College, Maxwell AFB, Ala.
9. June 1997 - June 1999, Commander, 1st Airlift Squadron, and Deputy Commander, 89th Operations Group, Andrews AFB, Md.
10. July 1999 - July 2001, U.S. Transportation Command liaison officer to Commander-in-Chief United Nations Command, Combined Forces Command, U.S. Forces Korea, Yongsan Army Garrison, South Korea
11. July 2001 - April 2002, Deputy Commander, 6th Operations Group, MacDill AFB, Fla.
12. April 2002 - August 2003, Commander, 6th Operations Group, MacDill AFB, Fla.
13. August 2003 - January 2004, Vice Commander, 86th Airlift Wing, Ramstein Air Base, Germany
14. January 2004 - April 2006, Commander, 86th Airlift Wing, Ramstein AB, Germany
15. April 2006 - January 2008, Deputy Director of Current Operations and Training, Deputy Chief of Staff for Air, Space and Information Operations, Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C.
16. January 2008 - January 2009, Vice Commander, 18th Air Force, Scott AFB, Ill.
17. January 2009 - January 2010, Commanding General, Coalition Air Force Transition Team, Baghdad, Iraq
18. January 2010 - May 2011, Commander, Spaatz Center for Officer Education, and Commandant, Air War College, Maxwell AFB, Ala.
19. June 2011 - Present, Director, Global Reach Programs, Office of the Assistant Secretary of the Air Force for Acquisition, Headquarters U.S. Air Force, Washington, D.C.

SUMMARY OF JOINT ASSIGNMENTS

1. May 1993 - June 1996, legislative liaison, Commander-in-Chief's Initiative and Legislative Affairs Group, U.S. Transportation Command, Scott AFB, Ill, as a major
2. July 1999 - July 2001, U.S. Transportation Command liaison officer to Commander-in-Chief United Nations Command, Combined Forces Command, U.S. Forces Korea, Yongsan Army Garrison, South Korea, as a colonel
3. January 2009 - January 2010, Commanding General, Coalition Air Force Transition Team, Baghdad, Iraq, as a brigadier and major general

FLIGHT INFORMATION

Rating: Command pilot

Flight hours: More than 4,200

Aircraft flown: A/C-208, Mi-17, C-130, C-21, KC-135, C-37, C-32, VC-137, C-12, C-141, T-37 and T-38

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 3 oak leaf clusters

Air Medal

Aerial Achievement Medal

Joint Service Commendation Medal

Air Force Commendation Medal with oak leaf cluster

Air Force Achievement Medal

OTHER ACHIEVEMENTS

2005 Public Affairs Special Achievement Award for Commander Support, Secretary of the Air Force

PUBLICATIONS

Good or Great Colonel, It's Up To You!, Air & Space Power Journal, Maxwell AFB, AL, Spring 2011

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 30, 1979

First Lieutenant Nov. 19, 1981

Captain Nov. 19, 1983

Major July 1, 1991

Lieutenant Colonel Aug. 1, 1996

Colonel March 1, 2000

Brigadier General Aug. 3, 2006

Major General Aug. 19, 2009

(Current as of June 2011)



BIOGRAPHY

UNITED STATES AIR FORCE

MAJOR GENERAL NOEL T. "TOM" JONES

Maj. Gen. Noel T. "Tom" Jones is Director, Operational Capability Requirements, Deputy Chief of Staff for Operations, Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C. In this position, he establishes policy for operational capabilities-based requirements. The directorate supports major commands in developing and evaluating requirements for Air Force-wide modernization programs including fighters, bombers, mobility aircraft, space systems, command and control, munitions, missile defense and Air Force irregular warfare requirements. He chairs the Air Force Requirements Oversight Council and is responsible for shaping and finalizing capabilities-based requirements documents for approval by the Joint Requirements Oversight Council. He directs and supervises the activities of more than 125 military and civilian employees in 6 divisions, including requirements officers, weapon systems experts, and professional, technical and clerical staffers.



General Jones was commissioned in 1980 following graduation from the U.S. Air Force Academy. He completed undergraduate pilot training in 1981, has served as an F-16 instructor pilot and operations officer, and has had numerous flying command positions. The general commanded a fighter squadron, operations group, the 332nd Expeditionary Wing in Southwest Asia during Operation Iraqi Freedom, and a fighter wing. The general held staff assignments at North American Aerospace Defense Command, Air Combat Command and the National Security Agency. Prior to his current assignment, he was the Director, Strategic Plans and Assessment, U.S. Forces-Iraq, U.S. Central Command, Baghdad, Iraq.

General Jones is a command pilot with more than 3,500 flying hours, including combat sorties over Iraq in operations Southern Watch, Desert Fox and Iraqi Freedom.

EDUCATION

1980 Bachelor of Science degree in political science, U.S. Air Force Academy, Colorado Springs, Colo.
 1986 Distinguished graduate, Squadron Officer School, Maxwell AFB, Ala.
 1987 Master's degree of aviation science, Embry-Riddle Aeronautical University
 1992 Army Command and General Staff College, Fort Leavenworth, Kan.
 2000 Master's degree in national security and strategic studies, Naval War College, Newport, R.I.
 2008 Intelligence Community Senior Leadership Program, National Security Agency, Washington, D.C.

ASSIGNMENTS

1. June 1980 - June 1981, student, undergraduate pilot training, Columbus AFB, Miss.
2. April 1982 - November 1984, life support officer, training officer and Chief of Scheduling, 84th Fighter Interceptor Training Squadron, Castle AFB, Calif.
3. December 1984 - January 1985, student, lead-in fighter training, Holloman AFB, N.M.
4. February 1985 - September 1985, pilot, F-16 Replacement Training Unit, MacDill AFB, Fla.
5. October 1985 - November 1988, flight safety officer, instructor pilot and flight commander, 613th Tactical Fighter Squadron, Torrejon Air Base, Spain
6. December 1988 - May 1991, instructor pilot, training officer and wing executive officer, 62nd Tactical Fighter Training Squadron, MacDill, AFB, Fla.
7. June 1991 - June 1992, student, Army Command and General Staff College, Fort Leavenworth, Kan.
8. July 1992 - November 1994, Chief, War and Mobilization Branch; executive officer and Chief of Staff for the Director of Operations, North American Aerospace Defense Command, Peterson AFB, Colo.
9. December 1994 - December 1995, assistant operations officer, later, operations officer, 35th Fighter Squadron, Kunsan AB, South Korea
10. January 1996 - October 1997, operations officer, 523rd Fighter Squadron, Cannon AFB, N.M.
11. November 1997 - June 1999, Commander, 522nd Fighter Squadron, Cannon AFB, N.M.
12. July 1999 - June 2000, student, Naval War College, Newport, R.I.
13. July 2000 - July 2001, Deputy Commander, 20th Operations Group, Shaw AFB, S.C.
14. August 2001 - January 2003, Commander, 20th Operations Group, Shaw AFB, S.C.
15. February 2003 - June 2003, Commander, 332nd Air Expeditionary Wing, Southwest Asia
16. July 2003 - October 2004, Commander, Squadron Officer College, Air University, Maxwell AFB, Ala.
17. November 2004 - May 2006, Inspector General, Headquarters Air Combat Command, Langley AFB, Va.
18. June 2006 - July 2008, Commander, 56th Fighter Wing, Luke AFB, Ariz.
19. July 2008 - May 2010, Deputy Chief, Central Security Service, National Security Agency, Fort George G. Meade, Md.
20. June 2010 - May 2011, Director, Strategic Plans and Assessment (J5), U.S. Forces-Iraq, U.S. Central Command, Baghdad, Iraq
21. May 2011 - present, Director, Operational Capability Requirements, Deputy Chief of Staff for Operations, Plans and Requirements, Headquarters U.S. Air Force, Washington, D.C.

SUMMARY OF JOINT ASSIGNMENTS

1. July 1992 - November 1994, Chief, War and Mobilization Branch; executive officer and Chief of Staff for the Director of Operations, North American Aerospace Defense Command, Peterson AFB, Colo., as a major
2. July 2008 - May 2010, Deputy Chief, Central Security Service, National Security Agency, Fort George G. Meade, Md., as a brigadier general and major general
3. June 2010 - May 2011, Director, Strategic Plans and Assessment (J5), U.S. Forces-Iraq, U.S. Central Command, Baghdad, Iraq, as a major general

FLIGHT INFORMATION

Rating: Command pilot
 Flight hours: More than 3,500
 Aircraft flown: Primarily T-33, T-37, T-38 and F-16

MAJOR AWARDS AND DECORATIONS

Legion of Merit with oak leaf cluster
 Defense Superior Service Medal with oak leaf cluster
 Bronze Star Medal
 Defense Meritorious Service Medal
 Meritorious Service Medal with oak leaf cluster
 Air Medal
 Aerial Achievement Medal with oak leaf cluster
 Air Force Commendation Medal with oak leaf cluster
 Combat Readiness Medal with three oak leaf clusters
 National Defense Service Medal with bronze star

Armed Forces Expeditionary Medal
Iraq Campaign Medal
Global War on Terrorism Expeditionary Medal
Global War on Terrorism Service Medal
Korea Defense Service Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 28, 1980
First Lieutenant May 28, 1982
Captain May 28, 1984
Major Oct. 1, 1991
Lieutenant Colonel Nov. 1, 1996
Colonel March 1, 2001
Brigadier General Oct. 2, 2006
Major General Nov. 20, 2009

(Current as of July 2011)

**WITNESS RESPONSES TO QUESTIONS ASKED DURING
THE HEARING**

MARCH 27, 2012

RESPONSE TO QUESTION SUBMITTED BY MR. BARTLETT

Admiral MORAN. [The information was not available at the time of printing.] [See page 22.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

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Mr. BARTLETT. There continues to be a tremendous demand for rotorcraft support whether it's for troop transport, logistics, surveillance or attack missions. Given these platforms will likely be in even greater demand in the future and they will operate in potentially increased threat environments—please discuss how each of you are implementing lessons learned in terms of aircraft survivability equipment. Are you working together for a common approach or is there a necessity to come up with different solutions based on the mission profiles of the various platforms?

General ROBLING. The Naval Aviation Enterprise and Marine Corps, both have formal processes in place to incorporate lessons learned into the development of future requirements. Where Marine aviation mission sets overlap with other Services we certainly attempt a common approach.

RADM Moran has outlined the formal processes for capturing lessons learned for the Naval Aviation Enterprise, which encompasses Marine aviation. At the same time, the Marine Corps utilizes the Marine Corp Center for Lessons Learned (MCCLL) as our internal and formal process for the same historical and advancement documentation purposes for lessons learned.

Examples of pursuing a common approach include:

Using technology developed from the Air Force's Large Aircraft Infrared Red Countermeasure system (LAIRCM), the USN/USMC has developed the DON LAIRCM AAQ-24 program. This program includes next generation two-color Infrared (IR) sensors with an inexhaustible laser countermeasure (CM) system and is currently employed on our forward deployed CH-53E, MEU CH-46 fleet and future KC-130J aircraft leveraging the Air Force's LAIRCM integration design. In order to meet the current Hostile Fire Indication (HFI) requirement, we have invested funding into the DON LAIRCM program and developed the Advanced Threat Warner (ATW) system that includes two-color IR, laser, and HFI warning systems with planned installations in the CH-53E in FY13. Those assets will be re-capitalized and transferred to the CH-53K program.

The Joint and Allied Threat Awareness System IR Missile Warning system (AAR-59) is being developed by the USN/USMC based on lessons learned and performance limitations discovered during the recent conflicts in Iraq and Afghanistan. The AAR-59 will provide advanced IR missile warning capability and aircrew warning of laser based systems and indications for small arms, rockets and unguided threats. The AAR-59 has been designated the primary IR missile warning system solution for all new DOD aircraft and any planned ASE upgrades. It is designed to operate with all DOD aircraft and will interface with the Army led Common Infrared Countermeasures (CIRCM) and Air Force led DON Large Aircraft Infrared Countermeasures (LAIRCM) as part of an integrated response to attacking infrared missiles.

The USN/USMC intends to procure the U.S. Army's CIRCM system that is under development for smaller assault helicopters. This joint program will ensure a common solution across all DOD's platforms. For our larger assault platforms, the USN/USMC have purchased the LAIRCM system.

Our APR-39B(V)2 Radar Warning Receiver is undergoing a Class 1 Engineering Change Proposal (ECP) to correct obsolescence and performance deficiencies. The ECP will re-designate the box to the APR-39D(V)2 and provide an interface for AAR-59, CIRCM and ATW. The APR-39D(V)2 will be used as the ASE suite controller on USMC aircraft which will allow the onboard ASE systems to be upgraded without having to break into the aircraft's Operational Flight Plan (OFP); realizing a huge cost savings and turn-around time for software upgrades. The APR-39D(V)2 ECP will provide the capability for an Integrated ASE (IASE) capability to perform own-ship threat correlation and fusion and prepare threat data to be off-boarded for sharing throughout the digital battlefield. The APR-39D(V)2 system is currently undergoing evaluation by the Army and could become a common solution for radar warning across the Services.

Mr. BARTLETT. There appears to be a difference in opinion among the military services with regard to performance capabilities of UV-based warning systems versus IR-based systems. Does one type of system operate better than the other in

terms of false positive alarms, range of detection, and detection fidelity, especially in a high clutter environment?

General ROBLING. Among all current DOD users, there is no disagreement with regard to performance capabilities of UV-based warning systems versus IR-based systems. All DOD platforms are now, or will in the future transition from UV sensors to IR sensors in order to remain ahead of the advancements made by our enemies in both range and capabilities of the MANPAD threats. The current UV based missile warning systems (MWS) provide a higher number of false alarms in high clutter environments. False alarm rates are the biggest distraction to aircrew and the largest complaint we hear from our operators engaged in combat operations. UV sensors are also limited in range of detection and provide limited warning times due to its inability to declare at long ranges. UV sensors are also not capable of providing an accurate geo-location of the point of origin for exploitation. UV sensors performance significantly degrades in high clutter (industrial) environments. This is a critical lessons learned from combat operations in OEF/OIF and has been a driving requirement to switch to IR technology for increased survivability in high clutter areas.

Although UV sensors can provide a limited hostile fire indication (HFI) capability it is rudimentary and is limited in its growth potential due to lack of UV signatures emitted by ballistic weapons (Small Arms through Heavy Machine Guns). Two-color IR sensors were developed to meet the continuing multispectral threats and provide longer range of detection and warning times. Two-color IR sensors also provide a multifunctional capability with HFI. Two color IR also lowers the false alarms rates and provides higher probability of detecting and discerning between threat types. The current path of combining the MWS, laser warning and the HFI capability will also reduce the weight imposed on rotary winged aircraft of the current stand alone systems.

It has long been understood by the IRCM community that UV missile warning are significantly challenged by missiles launched from ranges near the threat kinematic limit and in industrial environment. Generalities that can be concluded when UV missile warning systems performance and IR missile warning system performance as follows:

(1) IR Missile Warning Systems detect threats launched from longer ranges than UV Missile Warning Systems. (2) IR Missile Warning System performance does not degrade in high clutter areas like UV Missile Warning System do. (3) UV Missile Warning System performance degrades when going from a rural to an industrial environment (increased clutter). (4) The UV Missile Warning Systems have a higher false alarm rate than IR Missile Warning Systems.

Mr. BARTLETT. The committee is familiar with the findings from the OSD Helicopter Survivability Task Force which concluded that a large percentage of aircraft fatalities occur as a result of Degraded Visual Environment (DVE) which includes three categories—brownout, control flight into terrain (CFIT) and wire strikes. What are the Services doing to address DVE? How soon do you project to have capability fielded within each Service?

General ROBLING. The Marine Corps is working on several programs, including Joint programs which seek to address DVE utilizing multiple alternatives and will then integrate these systems into the aircraft. The Marine Corps has already begun efforts to integrate day/night heads-up displays (HUD) and modern cockpit displays into helicopter cockpits. The Marine Corps has also begun to implement the Brown Out Symbolology Set (BOSS), developed by the Army, in Marine helicopters. Further work continues with the Army to update and refine BOSS and to integrate the symbolology with other aircraft sensors. To address brownout and wire-strikes, including uncharted wires, cables and obstacles, the Marine Corps requires a “see-through” DVE solution. Two technologies, a LASER based radar (LADAR) solution and a millimeter wave (MMW) radar solution, offer the required capability. The LADAR and MMW sensors are currently in the technology development phase and will begin testing in FY13 aboard the USMC designated lead test platform, the CH-53E. These technology demonstrations will facilitate assessment on the maturity of brownout solutions aboard a representative platform. By conducting an assessment based on technological maturity, platform integration complexity, projected weight, and cost the Marine Corps will develop a technological acquisition strategy for fielding a DVE capability to Marine rotary wing platforms. The Marine Corps is also monitoring a “see-and-remember” Pilot Vehicle Interface (PVI) technology which would render 3-D terrain images of the environment based on a pre-loaded terrain database. The intent is for the selected technology to reduce pilot workload during brownout landings, and ensure precision landing navigation of rotorcraft in DVE. Fielding will depend on USMC’s best balance between requirements and fiscally constrained resources.

The Marine Corps is also working on capability programs addressing CFIT prevention. For legacy aircraft, USMC is installing technologies such as Ground Proximity Warning System (GPWS) and Terrain Awareness Warning System (TAWS) to provide pilots with alerts for impending terrain collision. These technologies continue to advance with TAWS II, which will provide obstacle avoidance in conjunction with either an onboard obstacle database and/or data from an active sensor. TAWS II IOC is planned for FY17. Additionally, a POR for Midair Collision Avoidance Capability (MCAC) begins in FY14. This system will be based on Automatic Dependent Surveillance-Broadcast (ADS-B) In and Out and will use Government owned and developed software to prevent airborne collisions.

Finally, the USMC has worked to implement non-material mitigation through improved Tactics, Techniques, and Procedures (TTPs) in conjunction with current technologies to minimize the risks of DVE.

Mr. BARTLETT. There continues to be a tremendous demand for rotorcraft support whether it's for troop transport, logistics, surveillance or attack missions. Given these platforms will likely be in even greater demand in the future and they will operate in potentially increased threat environments—please discuss how each of you are implementing lessons learned in terms of aircraft survivability equipment. Are you working together for a common approach or is there a necessity to come up with different solutions based on the mission profiles of the various platforms?

Admiral MORAN. Naval Aviation has a formal process in place to incorporate lessons learned into the development of future requirements. Where our mission sets overlap we work towards a common approach.

Examples of this common approach include the Navy Enhanced Visual Acuity Program (EVA), a pre-Milestone A program with an Initial Operating Capability projected for FY18. The goal is to develop digital vision devices that improve visual acuity in low/no light and brown-out situations while maintaining the capability of the current analog night system. PMA-202 is coordinating with the Army and Air Force on program issues through the Aircrew Sub Systems Board (ASSB), which is a subcomponent of the Joint Aircrew Commonality Group (JACG), on this effort.

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Admiral MORAN. Requirement Officers and Program Managers are working together to incorporate DVE software and an integrated Helicopter Obstacle/Weather/Terrain/Traffic Awareness Warning System (HTAWS) into fleet aircraft. No official timeline has been established.

Mr. BARTLETT. The Marine Corps is currently developing the CH-53K program in order to replace its 53E helicopters. And although the Navy is also flying 53E

helicopters, the Navy does not have a requirement for the 53K. Clearly the MH-60 series rotorcraft is an excellent platform, but will it be able to carry the same loads from a Vertical Onboard Delivery (VOD) perspective than a 53E or 53K? Is there any possibility that in a few years the Navy might change their minds and validate a requirement for the 53K?

Admiral MORAN. The MH-60S currently fulfills the Navy requirement for Vertical Onboard Delivery despite not being able to carry the same loads as the MH-53E.

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General CROSBY. To obtain common approaches across the Services, the Navy, the Marine Corps, the Air Force, and the Army have established a Tri-Service Aircraft Survivability Equipment (ASE) working group that meets on a semi-annual basis. The Joint Capabilities Integration Development System scours Service requirements for opportunities to provide common solutions across the Services to meet identified capability gaps, especially those relating to ASE.

Through the Army's ASE Program Office, the Army develops and procures common survivability equipment for platforms wherever possible to maximize capabilities through efficient use of research and procurement dollars. The tenets of this effort include: sensor and threat correlation; suite control; Modular Open System Approach (MOSA); minimizing size, weight and power requirements; and enabling increased situational understanding. The Common Missile Warning System (CMWS) is one such system that provides capabilities across the majority of Army platforms. Some platforms require mission specific solutions that do not necessarily benefit the Army's entire fleet, though. The requirements for a jammer and hostile fire detection are examples where specific platforms may have unique requirements. Knowing the geo-location of the origin of small arms fire is an example of a requirement that may not be necessary on all platforms, but highly beneficial to the armed platforms.

The Army is currently developing the Common Infrared Countermeasure (CIRCM), which essentially defeats infrared seeking missiles with a laser countermeasure. The CIRCM is being designed with a MOSA, so that it can be interoperable with both the Army's CMWS and the Navy's missile warning system, known as the Joint and Allied Threat Awareness System. The Navy plans to leverage the Army's investment for Infrared Countermeasures.

The Army is also working closely with the Navy as they develop a next generation Radar Warning Receiver (RWR). The Navy has been able to meet most of the Army requirements with no additional cost to the receiver's development. To attempt to meet common inter-service solutions, the Army participates in the Navy's RWR preliminary design review.

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General CROSBY. Each sensor system, regardless of the spectrum it detects, has unique pros and cons. Primarily, the trade space regarding missile warning involves probability of detection, clutter rejection, cost and reliability. What works best for operating at 30,000 feet is not necessarily what works best at 1,000 feet and in situations used for Army aircraft. It is not so much a choice of "good," "better," or "best" between Ultraviolet (UV)-based sensors, Infrared (IR)-based sensors or hybrid sensor solutions, but what best mitigates the threat in the situations most common to each Service.

Upon extensive analysis, the Army invested in UV-based sensor solutions nearly 10 years ago. This investment continues to meet Army requirements at an affordable cost. The primary advantages of the Army's UV-based systems versus acquiring a new IR based systems are: the Army's UV system meets all its operational requirements for probability of detection and reliability; UV is considered solar blind, thus reducing susceptibility to solar radiation and natural clutter sources; and uncooled UV sensors are relatively low cost compared to cooled IR sensors. The Army's UV sensors' mean time between failures exceeds threshold and objective requirements, and further reduces total life cycle costs.

The Army has invested in a UV-based system over the course of the past 10 years, and has accumulate over two million combat flight hours with the current UV-based system. The Army has improved the UV sensor performance for missile warning to where its false positive rate is lower than the Army's performance requirement, and its operation in high clutter environments is comparable to, or greater than, the performance of the currently available IR systems. In order to maximize the Army's significant investment in its UV-based missile warning system, the Army continues to seek opportunities to improve its suite of sensors' performance through incremental, economical improvements. Adding economical IR capability to existing survivability sensors is something the Army will continue to research.

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General CROSBY. Based upon the Joint Requirements Oversight Council validated Aircraft Survivability Initial Capabilities Document, the Army is establishing a formal DVE acquisition program to provide the Army aircrews with a capability to safely perform flight operations during conditions where man-made and natural atmospheric obscuration restrict or limit flight visibility.

The Army is actively participating with Defense Advanced Research Project Agency, United States Air Force and the Navy on potential DVE technologies. The types of missions and tactics employed by each Service will dictate specific requirements for possible DVE materiel solutions.

Ongoing Army Aviation modernization programs are integrating technologies such as digital maps and development of improved handling qualities in our modernized airframes. In addition, we are looking at focused solutions including active radar penetrating sensors to address DVE operations in the legacy platforms in support of current operations as well as a bridge to an end-state modernized fleet.

In regard to when the capability will be fielded, the Army, in response to the Central Command (CENTCOM) DVE Operational Need Statement (ONS), is preparing for a limited fielding of an obscuration penetrating capability either in April or May of Second Quarter Fiscal Year 2014. In parallel with responding to the CENTCOM DVE ONS, the Army is moving forward with the DVE acquisition program, and expects a Materiel Development Decision in late 2012.

Mr. BARTLETT. The Army National Guard operates more than 800 Black Hawks, which represents about 45% of the Army's Black Hawk fleet. And as you know, the oldest UH-60A series Black Hawks, many more than 34 years old are operated by Guard units. Until recently, the rate of Guard Black Hawk modernization was keeping pace with the rate of the Active Army. However, the FY13 UH-60M Black Hawk helicopter funding has been reduced by more than 17% over last year's budget down to a rate of 59 aircraft per year, and it appears that the cuts have resulted in delayed fieldings to Army National Guard units. Can you explain what the impact of the FY13 budget request will have on the ability to modernize the National Guards Blackhawk fleet? What is the Army's plan to replace the older UH-60A platforms?

General CROSBY. The Army is addressing the Army National Guard ARNG modernization in three ways: procurement of new UH/HH-60Ms, cascading UH-60Ls model from the active forces to ARNG and, finally, A-L RECAP (converts UH-60A model aircraft to UH-60Ls) of ARNG aircraft. The recent Army decision to go to a nine-month deployment cycle necessitated all Fiscal Year 2012 (FY12) and FY13 UH-60M procurement funding go to modernizing two Active component Combat Aviation Brigades (CAB) thus delaying one ARNG Assault Helicopter Battalion (AHB) by two years. Fielding of new UH/HH-60Ms will begin in FY15 for this ARNG AHB and will be followed by an additional ARNG CAB. The ARNG is scheduled to receive 11 UH-60M and two HH-60M aircraft during the FY12-16 timeframe. Six of the 11 UH-60Ms will be procured on the Multi-Year VIII contract. After the buildup of the 13th CAB in FY13 and FY14, all cascaded UH-60L model aircraft from the active forces will go to ARNG, resulting in greater retirements of UH-60As. Finally, the Army A-L program converts UH-60A model aircraft to UH-60Ls. This program began in FY08; the first ARNG conversion was done in FY11. The current plan is to continue the conversions at a rate of 38 per year through FY15.

Mr. BARTLETT. The Army National Guard UH-72A Lakota helicopters are performing well in support of security missions on our Southwest border where there is an ever-increasing threat of hostility. Are you aware if the National Guard is supportive of utilizing the UH-72A for other missions such as the Balkans in order to relieve pressure on high demand rotary wing platforms and save operational funding? Has the Army consulted with the National Guard to identify opportunities for expanding the mission envelope of the UH-72A? Are you aware if the Army is working cooperatively with industry to explore potential UH-72A survivability modifications, such as establishing a Cooperative Research & Development Agreement (CRADA)?

General CROSBY. The Army is aware that the National Guard Bureau (NGB) is interested in expanding the operational spectrum of the UH-72A Lakota. The Army has not consulted with the NGB to identify opportunities for expanding the operational envelope. The UH-72A Lakota was procured to accomplish missions in a permissive environment that were once accomplished with the legacy light utility UH-1 and OH-58 fleets. The intent was for the UH-72A Lakota to accomplish these missions, freeing UH-60 Blackhawks to accomplish combat missions in uncertain or hostile environments. As a result, the Office of the Secretary of Defense for Operational Test and Evaluation Directorate concluded that the UH-72A Lakota was not required to undergo survivability testing and certification and was granted a waiver for this statutory requirement. The estimated cost of testing and modifying

the Lakota to meet the survivability and certification requirements would be \$793 million for the fleet. This cost includes: hardening navigation and communication systems against electromagnetic radiation, live fire test and evaluation, survivability testing, sustainment costs in non-permissive environments and dynamic component upgrades. The Army is not presently engaged with industry to establish a cooperative development program to develop survivability modifications for the UH-72A Lakota.

Mr. BARTLETT. There continues to be a tremendous demand for rotorcraft support whether it's for troop transport, logistics, surveillance or attack missions. Given these platforms will likely be in even greater demand in the future and they will operate in potentially increased threat environments—please discuss how each of you are implementing lessons learned in terms of aircraft survivability equipment. Are you working together for a common approach or is there a necessity to come up with different solutions based on the mission profiles of the various platforms?

General KANE. The Air Force participates in the Joint Helicopter Survivability Task Force, which provides a forum to discuss current and future threats, lessons learned, and available and future technologies. We continue to pursue defensive system upgrades and seek to capitalize on other service lessons learned. The Air Force leverages common solutions when able, but due to the high threat mission profiles the Air Force flies, independent solutions are sometimes required.

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General KANE. UV and IR systems each have their strengths and weaknesses. The combined survivability systems (UV and IR) on Air Force platforms allow for a high level of survivability against a wide array of threats. The Air Force continues to balance current technology, capability, and affordability to achieve a high level of defensive capability. As new technology becomes available the Air Force evaluates the new systems for reliability, fidelity, and effectiveness.

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General KANE. The Air Force is pursuing several capabilities to improve survivability in degraded visual environments (DVE) for our rotary wing assets. The CV-22 currently has a robust enroute DVE capability, which includes moving maps with digital terrain and elevation data (DTED) and a terrain following radar. In FY12, we start installing an improved hold and hover system and moving maps with DTED on the HH-60G. The improved hold and hover system provides a coupled approach to the ground capability which helps pilots maintain the landing flight path during brownout conditions. The moving maps with DTED provide visual and audible warning for terrain avoidance. Starting in FY13, we will install a commercial off-the-shelf based helicopter terrain awareness and warning system (HTAWS) on the UH-1N.

Additionally, the Air Force is participating in the Three Dimensional-Landing Zone (3D-LZ) Joint Capability Technology Demonstration (JCTD). The 3D-LZ JCTD will demonstrate and assess technologies which display high-resolution three-dimensional imagery, integrated with flight symbology, to enable safe landing in DVE, provide cable warning and obstacle avoidance, and provide HTAWS functionality. Flight test is scheduled for FY14.

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QUESTIONS SUBMITTED BY MR. WILSON

Mr. WILSON. Two and a half years ago the Department of Defense Acquisition, Technology & Logistics leadership asked Industry to self form into the "Vertical Lift Consortium" (VLC). I understand the goal was to utilize the VLC to more effectively define requirements to streamline development of Vertical Lift technology and increase program success at lower risk and cost. In addition, the competitive forum would leverage the many domains that make up the Vertical Lift Community with emphasis on improving communication and teaming with non-traditional defense companies and small businesses. This DOD initiative embodies the objectives of the Weapons Systems Acquisition Reform Act (WSARA) by streamlining requirement and acquisition processes, proving out technologies early, embracing competition and more effectively investing precious Research & Development dollars. Based on the Department's experiences over the last 2½ years, what are the results of this partnership and how will the VLC be utilized for future vertical lift initiatives?

General ROBLING. 1. What are the results of this partnership? It's important to note that more than 90 representatives of the vertical lift industry and academia self-formed into the Vertical Lift Consortium (VLC) in an effort to partner with the DOD. The most recent Executive Steering Group (ESG) held in February marked the ninth time VLC leadership attended and participated in Future Vertical Lift (FVL) strategic planning. This type of integrated collaboration offers opportunities to leverage both DOD and Industry resources through unity of effort.

2. How will the VLC be utilized for future vertical lift initiatives? The Marine Corps remains an active participant within the FVL Integration Group, whose aim is to team with the VLC for strategic development and implementation of future generations of vertical lift capabilities. Our goal as a group is to ensure we design, develop, and deliver the next generation of vertical lift aircraft with advanced capabilities to the Joint Warfighter. This collaborative effort allows the VLC to provide the FVL ESG early insight into future capabilities that are in development by industry. Equally important, this team approach allows the ESG to provide Industry insight into the aircraft capabilities direction that DOD requires. Cooperation, collaboration, and teaming with the VLC allows DOD to accelerate and leverage the

development of contributing technology and transition that technology into practical applications in an expedited and lower cost fashion.

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Admiral MORAN. The VLC has had a positive impact on the Future Vertical Lift Initiative; the VLC has been involved and will continue to be involved to the maximum extent that DOD policy allows. The VLC has provided an opportunity to define and develop specific maritime requirements. The most significant impact the VLC will have on this OSD-led program will occur during the Material Solutions Analysis Phase; this scheduled to begin by the Army in late FY13.

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General CROSBY. The Department of Defense (DOD) previously submitted a report to the congressional defense committees on the future development of vertical lift aircraft, as directed by the United States Congress in section 255 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 (FY09), Public Law 110-417. That report included a preliminary technology roadmap. The Department is working to update the roadmap and to identify and address the critical enabling technologies for future program success; among those activities was the award of an Other Transaction Agreement (OTA) under the authority of section 845 of the National Defense Authorization Act for FY94, Public Law 103-160 (as amended) by the Army with the Vertical Lift Consortium (VLC) to develop technologies for vertical lift aircraft. Section 845 OTAs are tailored to non-traditional contractors, which was consistent with the Department's intent to stimulate increased contractor participation and new ideas.

The VLC is a non-profit organization and membership is open to industry, including non-traditional contractors. Orders under the OTA are awarded to individual members of the VLC after publication of a request for proposals and using competitive methods for selection. While implementing the OTA, a vigorous and valuable dialogue with the collective organization that represents much of industry has provided positive feedback to the Army, the Department and the Services.

While the Department's budget request for FY13 does not specifically identify funding activities under this OTA, the Department has allocated about \$1.4 million from funding accounts in the current year for this purpose; contract orders are anticipated this Spring that will use the OTA as a transaction award instrument for the development of vertical lift technologies.

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General KANE. The Vertical Lift Consortium has been an active participant in the Future Vertical Lift Executive Steering Group. The Air Force, along with sister Services, through the Future Vertical Lift program, maintains partnerships and information sharing efforts to connect Science and Technology, Acquisitions, and Requirements. The Air Force continues to realize value in the partnering relationship developed through the VLC.

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QUESTIONS SUBMITTED BY MR. LOBIONDO

Mr. LOBIONDO. As the Committee has reviewed the Fiscal Year 2013 out-year procurement requests, we note that the Department of Defense has taken 24 V-22 aircraft out of the next five years—going from 122 aircraft down to 98. Can you discuss the Department's plan on buying a full program of record on the V-22?

General ROBLING. The decision to delay the purchase of 24 MV-22s until FY18 and FY19 was based on budget pressures currently being faced by the Department of the Navy. The Marine Corps remains fully committed to completing the Program of Record for a total of 360 aircraft and plans to submit budget requests accordingly.

Mr. LOBIONDO. What are the benefits of a multiyear contract for the V-22? What is the projected cost savings of this multiyear?

General ROBLING. The proposed V-22 MYP II contract presents a substantial cost avoidance of greater than \$800M in comparison to single year procurement. The benefits of this multiyear contract include:

- Stable and continuous production resulting in lower overhead rates.

- Enhanced workforce stability resulting in lower labor costs.
- Long Term Agreements (LTAs), Economic Order Quantity (EOQ) buys, and reduced setup costs resulting in lower material costs.
- Broadening the competitive base with opportunity for participation by suppliers not otherwise willing or able to compete for single year procurements.
- Meeting minimum-order quantities on many components.
- Minimizing parts obsolescence.
- Reducing the cost associated with annual proposal preparation and negotiation.
- Lowering the percentage of profit relative to total costs.

Mr. LOBIONDO. The Navy has stated that it intends to replace the aging C-2 Greyhound, the current Carrier OnBoard Delivery (COD) aircraft. As the Navy plans for its future Airborne Resupply/Logistics for Seabasing (AR/LSB) capability, does it not make sense to use an airplane that is currently in the DOD inventory that is much more efficient to use, such as the V-22 Osprey?

Mr. GILPIN. The Navy is currently updating the AR/LSB Analysis of Alternatives which will evaluate the relative cost and technical advantages of various alternatives. The AoA Update is looking closely at the V-22. The AoA Update should be complete in the May timeframe.

Mr. LOBIONDO. What are the benefits of a multiyear contract for the CH-47? What is the projected cost savings of this multiyear?

General CROSBY. The Army defers to the U.S. Marine Corps as they are responsible for the fielding of the V-22.

QUESTION SUBMITTED BY MR. TURNER

Mr. TURNER. One of the major themes aside from the declining procurement rates of military equipment is the impact on the strategic industrial baseline. There have been numerous GAO studies which have concluded that the current defense industrial baseline is not only unbalanced but that the industrial baseline prior to the 2012 Budget Control Act was incapable of surging production rates in times of crisis. Additionally the U.S. has become increasingly dependent on foreign sources of supply. Limiting our discussion to the H-60 Black Hawk helicopter for the Army National Guard, not only have procurement rates dropped 17% but the latest estimates now indicate that the last Army National Guard UH-60A will not be retired until 2027 which will make the helicopter more than 37 years old. Military weapon systems have become so technologically complex that even with an industrial baseline available, expediting production is extremely difficult. For example on the UH-60 and MH-60 there are five critical components dealing with the rotor which is made by only one manufacturer; Main Rotor Spherical Bearing, Tail Rotor Pivot Bearing, Main Rotor Pitch Link Rod Ends, Tail Rotor Pitch Link Rod Ends and the Main Rotor CF Bearing.

How much consideration have you given toward the retainment of the Industrial Baseline? What steps have you taken or currently taking to ensure an available supply of these critical components? Have the Services accomplished any strategic thinking on a continued consolidation of the supply market and the eventuality that we are reliant on overseas replacement components? Is this an issue which has been conveyed to OSD? If so, what is their response?

General KANE. The Air Force depends on a reliable, responsive industrial base to produce and sustain the capabilities needed to fly, fight and win across the air, space and cyber domains. There is emerging across the Department of Defense a shared sense of concern over the impact of the forthcoming reduced demand signal on the domestic industrial base, particularly at the lower tiers. To identify these risks and, where appropriate, develop mitigation actions, the Service staffs are working closely with each other and with their counterparts on the OSD staff. Some of these interactions leverage long-established groups such as the Defense Acquisition Board; in other areas, OSD has helped to facilitate new discussions among the components on shared concerns, such as energetic materials. Across the Air Force, our senior leaders fully recognize the strategic challenge of sustaining critical domestic industrial base capabilities during a period of fiscal austerity. Each day, our managers within the acquisition and sustainment communities successfully respond to these types of challenges ensuring the readiness of the Air Force. The Air Force will continue to work closely with the other Services and with OSD on all levels to sustain our capability to fly, fight and win.

QUESTION SUBMITTED BY MR. COOPER

Mr. COOPER. The Army National Guard operates more than 800 Black Hawks, which represents about 45% of the Army's Black Hawk fleet. And as you know, the oldest UH-60A series Black Hawks, many more than 34 years old are operated by Guard units. Until recently, the rate of Guard Black Hawk modernization was keeping pace with the rate of the Active Army. However, the FY13 UH-60M Black Hawk helicopter funding has been reduced by more than 17% over last year's budget down to a rate of 59 aircraft per year, and it appears that the cuts have resulted in delayed fieldings to Army National Guard units.

What is the Army's plan to replace the older UH-60A platforms? What is the timeline for when all UH60-A platforms are upgraded?

General CROSBY. The Army is addressing the Army National Guard (ARNG) modernization in three ways: procurement of new UH/HH-60Ms, cascading UH-60Ls model from the active forces to ARNG, and, A-L RECAP of ARNG aircraft. The recent Army decision to go to a nine month deployment cycle necessitated all Fiscal Year 2012 (FY12) and FY13 UH-60M procurement funding go to modernizing two Active component Combat Aviation Brigades (CAB), thus delaying one ARNG Assault Helicopter Battalion (AHB) by two years. Fielding of new UH/HH-60Ms will begin in FY15 for this ARNG AHB and will be followed by an additional ARNG CAB. The ARNG is scheduled to receive 11 UH-60M and two HH-60M aircraft during the FY12-16 timeframe, six of the 11 UH-60Ms will be procured on the Multi-Year VIII contract. After the buildup of the 13th CAB in FY13 and FY14, all cascaded UH-60L model aircraft from the active forces will go to ARNG resulting in greater retirements of UH-60As. Finally, the Army A-L program converts UH-60A model aircraft to UH-60Ls. This program began in FY08; the first ARNG conversion was done in FY11. The current plan is to continue the conversions at a rate of 38 per year through FY15.

QUESTION SUBMITTED BY MS. TSONGAS

Ms. TSONGAS. Air Combat Command (ACC) is responsible for training and equipping rescue forces. The command announced last month that they are considering acquiring used helicopters from the United States Army in lieu of purchasing new, replacement HH-60M aircraft. There has been no public release announcing a change to the Operational Loss Replacement program and it is not known how the negotiations with the Army are proceeding. The Army is currently modernizing its fleet with HH-60M aircraft.

Has the Air Force adopted a new acquisition strategy in lieu of purchasing new helicopters? If so, how does the new strategy improve upon the command's ability to execute the rescue mission? What are the risks associated with the new strategy?

General JONES. The HH-60G Operational Loss Replacement program delivered the first two minimally modified UH-60M aircraft in September 2011, with the third scheduled for May 2012. Aircraft #4 will be modified to an HH-60G like configuration. The Air Force is considering multiple options on how best to modify H-60 aircraft to get the most capability to the warfighter in the shortest time, including modifying the UH-60M or low hour UH-60Ls from the Army. The decision is currently in its final stages and modifications will begin in late 2012 with delivery beginning late 2013 and completing in 2015.

QUESTIONS SUBMITTED BY MR. ROONEY

Mr. ROONEY. I have been told that the CH-53K program is only rotorcraft program currently in development for any of the Services and that it will deliver three times the lift capability, provide fly-by-wire technology, incorporate the latest survivability techniques including a composite airframe. Given the difficulties you have had fielding a new amphibious vehicle, I assume this program becomes even more important for ship to shore operations? What can we do to help you accelerate or at least highlight the importance of this asset?

General ROBLING. The CH-53K Program is the only ACAT 1D developmental rotorcraft program within DOD and is currently under a Engineering and Manufacturing Demonstration (EMD) contract.

The CH-53K is a new build helicopter that evolves the CH-53E design to improve operational capability, reliability, maintainability, survivability, and cost of ownership. The CH-53K is a critical enabler of the MEB 2015 concept as it is the only shipboard-compatible rotorcraft capable of lifting 100% of the air-transportable equipment in the Marine Corps' "Middle Weight Force" vertical MAGTF in support

of current and future warfighting concepts. The CH-53K is designed to transport 27,000 lbs of external cargo under Navy high/hot conditions out to 110nm (nearly three times the CH-53E), vastly improving Ship-to-Objective Maneuver (STOM).

The CH-53K Program has met all Obligation & Expenditures (O&E) benchmarks since FY08, is on schedule, stands on a solid technical foundation with critical technologies maturing to plan, and continues to meet or exceed all Key Performance Parameters (KPPs).

Accelerating CH-53K:

Current year: An additional \$32.1M of R&D funds in FY-13 would result in an acceleration of IOC from Q1 FY-19 to Q4 FY-18 enabling more efficient program execution and reduce out-year R&D funding requirements.

Furthermore, additional APN1 funding in FY16-18 could increase the CH-53K procurement ramp, by leveraging Sikorsky's additional production capacity, thereby accelerating delivery of CH-53K to the Fleet Marine Forces.

Mr. ROONEY. With the capabilities that the CH-53K helicopter will bring to the Marine Corps, and their need for this type of heavy lift, this program is a no-brainer. What I want to understand, however, is what is the Navy's plan for heavy lift and why are you not playing in this program? I understand that the Navy's current fleet of vertical lift platforms cannot even transport the F135 engine from ship to ship. Is this correct?

Mr. GILPIN. The MH-60S currently fulfills the Navy requirement for vertical lift. Regarding transport of the JSF engine, the JSF whole engine and the engine shipping system (ESS) was not designed for VERTREP. The MH-53E, CH-53E and MV-22 can externally transport the F135 engine modules.

Mr. ROONEY. I understand that the Army will soon host a "fly-off" for potential candidates in the Armed Aerial Scout program which is intended to replace the Kiowa Warrior. I understand the need to replace these aging venerable aircraft and I understand the long sordid history of attempting to do so from Comanche to the Armed Reconnaissance Helicopter. My worry, however, is that by hosting this "fly-off" the Army is considering taking the easy way out of a troubled history and settling for a platform that brings no new capability to the fight. The Services have long neglected funding for rotorcraft R&D but there is new technology out there that could be game-changing. If one consideration for the Army is to once again, SLEP the Kiowa for a while longer in order to bring on this new technology out there, then I would advocate you take such a path. Why would the Army even consider current aircraft bringing no new capability to the warfighter?

General CROSBY. The Army is conducting market research by releasing a Request for Information, conducting discussions with industry, and giving industry an opportunity to demonstrate potential solutions to help determine what technologies are available from industry that may contribute to a material solution option. The Army will not compare individual results, but rather assess their capability against the capability gaps identified in the initial capabilities document. The end state is to identify an affordable, achievable, moderate risk material solution option based on the current state of technology in the market. If the results of the voluntary flight demonstration(s) determine that a materiel solution option that delivers greater capability is not affordable, then the Army will consider pursuing a Service Life Extension Program (SLEP) of the Kiowa Warrior fleet. Affordability will be a major factor in the capabilities determination decision at the end of the market research effort.

QUESTIONS SUBMITTED BY MRS. ROBY

Mrs. ROBY. In regard to mission planning during the hearing we heard about what the military is doing to deal with Degraded Visual Environment (DVE). I would like to hear more about what the Army and other Services are doing to improve mission planning for Rotary Wing operation. I've been briefed by a constituent that is developing a tool that uses terrain and soil features, environmental forecasts, and aircraft performance attributes to provide qualitative assessments of landing zones and the operational environment. Since mission planning is the initial step to reducing risk, would having the capability to identify more favorable areas prior to actual execution that decrease the impact of a DVE prove beneficial? In the same context, would the capability to view the overall impacts of the environment on rotary performance with respect to power management (the leading cause of aircraft mishap) assist in the mission planning and decisionmaking process and create greater situational awareness prior to crews encountering these conditions?

General ROBLING. Landing Zone (LZ) selection during the mission planning process is influenced by numerous factors. Intelligence imagery analysts provide a list of LZs, the Ground Combat Element and Air Combat Element (GCE/ACE) planners select the best zones to support the mission, and Meteorology and Oceanographic (METOC) support provides a forecast of the environmental conditions. While this planning provides an accurate prediction of suitable LZ's, it does not account for real-time changes in environmental conditions that can contribute to DVE.

The calculation of power requirements are a critical part of mission planning. During mission planning, power requirements are determined by what type of approach/landing may be required, obstacles surrounding the zone, zone constitution, wave off lanes, possible threat, and environmental conditions.

In both instances, having a planning tool for DVE and power management would contribute to safety and situational awareness. The tools would compliment rotary wing requirements for an in-flight "see-through" capability designed to mitigate the effects of a DVE (brownout, white-out (snow), fog, rain, smoke, night, etc.).

Mrs. ROBY. It is my understanding that the Navy has chosen to defer funding for five MH-60R helicopters, cutting the longtime steady procurement rate of 24 per year to 19 per year for FY13. In addition, I understand the out-year procurement goes from 19 aircraft in FY14 to 38 aircraft in FY16. I can tell you that from a contractor perspective, these wild swings in procurement rates are extremely difficult to manage in terms of suppliers and workforce. While I understand it might make sense for the Navy to do this from a budget perspective, was there ever any thought to what it might do to the businesses, particularly the small businesses, who might have to handle this as well as the impact it will have on Navy's future budget?

Admiral MORAN. Budgetary constraints and considerations drove the reductions in MH-60R procurement totals in FY 2013 and 2014. The Foreign Military Sale of 24 MH-60Rs to Australia in conjunction with the Navy's MH-60R procurement schedule is working to level industry production schedules. The increase in MH-60R procurement in FY 2016 is designed to complete the program of record (POR) purchase on timeline in order to support Fleet Squadrons' transitions, stand-ups, and operations. The increase in FY 2016 procurement is tempered for industry by an aircraft delivery schedule phased through the beginning of FY 2019. The Navy expects the signing of the multiyear contracts to procure the remaining MH-60R POR to realize considerable cost savings, positively impacting future budgets.

Mrs. ROBY. I understand that the Navy is within a few years of ending production of both the MH-60S and MH-60R. I am also aware that the Naval Aviation Requirements Group has identified a number of Seahawk airframe upgrades that are currently not funded in the out-years but are critical investments in the airframe as performance requirements and weight grows on the aircraft. The MH-60S and MH-60R have been in the Fleet since 2001 and 2006 respectively and are expected to remain in service as critical Battle Group capability until at least 2030. Investing in keeping them current and relevant is important to future operational effectiveness and success. Could you tell me what the Navy's plan is with regard to these key improvements as well as others not yet identified?

Admiral MORAN. The MH-60R and MH-60S helicopters are both multimission helicopters with steadily increasing capabilities, which tends to increase the gross weight of the airframe. As the helos become heavier, their ability to perform in high/hot environments degrades. There are often operational risk mitigators that can be implemented to enable mission completion (reduce fuel loading, reduced ammunition, reduced passengers), but sometimes there are not, and airframe upgrades (engines and rotor blades) are the most effective way to maintain acceptable performance margins in challenging environmental conditions at high gross weights.

The MH-60 program office, PMA-299, has conducted non-recurring engineering to develop incremental engine performance and reliability upgrades that "buy-back" the critical performance margin. As the aircraft continue to age, they will receive the necessary performance upgrades to enable mission success.

Mrs. ROBY. I am also curious on what would be different in FY16 that would allow the Navy to handle the procurement of 38 aircraft or, will this number come down in next year's budget submit causing a break in the Navy's portion of the multiyear contract? Would it not be easier to go back to the steady-state of 24 aircraft per year?

Admiral MORAN. In FY 2015 the combined purchase of MH-60R and MH-60S totals 39 aircraft. In FY 2016, the first year following the completion of MH-60S purchases, the Navy plans to procure 38 MH-60R aircraft in order to sustain overall H-60 procurement rates and to complete the program of record (POR) purchases on a timeline required to support Fleet MH-60R Squadron transitions, stand-ups, and operations. No change in procurement and POR numbers is planned which would

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Mr. GILPIN. The ability to identify more favorable landing areas during mission planning would be beneficial; however, the majority of Navy helicopter operations are overwater. The USN and USMC are investing in the Joint Mission Planning System (JMPS) to provide more efficient mission planning.

Mrs. ROBY. What is the projected weight and cost impact of the Army efforts to correct the "operationally unsuitable" (Army quote) H-60M crashworthy troop seat? What are the Army's alternate plans if the seat cannot be corrected within reasonable weight and cost thresholds (relative to the existing acceptable seat used in the legacy H-60A/Ls)? Why hasn't the Army actively evaluated other solutions through their Continuous Technology Refreshment (CTR) program that may provide significant reductions in weight and cost?

General CROSBY. Planned improvements to the Troop seat include contoured seat pan with pad, reduced side webbing to improve passenger egress and ingress times, and changes to the attaching mounts to make the seat easier to install. The targeted weight increase associated with these changes is one pound or less per seat. The projected cost of these changes has not been negotiated, but may add approximately \$500 to the cost of each seat. We have every reason to believe that the seats can be improved to the satisfaction of the user. If we get to a point where the seat cannot meet user expectations, use of the legacy seats or a new program start will be investigated. Note that the legacy A-L seat was qualified to a lower G rating than the existing M model seat. A Continuous Technology Refreshment program for hardware has only recently been awarded. While weight and cost are important, they are not the only requirements that must be evaluated when considering seat designs for the H-60. The Program Management Office is not aware of an existing seat design that better meets our current specification requirements.

Mrs. ROBY. Boeing recently down-selected several organizations' seats for the Army's effort to implement crashworthy troop seating on the H-47F. What are the weights and costs of these contenders? And, how do they compare to the 10-pound threshold and \$2,300 unit cost of a seat being evaluated by the Office of the Secretary of Defense?

General CROSBY. The notional crashworthy troop seat evaluated by the Office of the Secretary of Defense was a representative seat employed to support their analysis of potential passenger safety improvements. The seat is not compatible with the current configuration of the CH-47F Chinook. Boeing is conducting an evaluation of potential candidate seats. They are early in the evaluation process and have not yet presented their findings to the program office.

Mrs. ROBY. In regard to mission planning during the hearing we heard about what the military is doing to deal with Degraded Visual Environment (DVE). I would like to hear more about what the Army and other Services are doing to improve mission planning for Rotary Wing operation. I've been briefed by a constituent that is developing a tool that uses terrain and soil features, environmental forecasts, and aircraft performance attributes to provide qualitative assessments of landing zones and the operational environment. Since mission planning is the initial step to reducing risk, would having the capability to identify more favorable areas prior to actual execution that decrease the impact of a DVE prove beneficial? In the same

context, would the capability to view the overall impacts of the environment on rotary performance with respect to power management (the leading cause of aircraft mishap) assist in the mission planning and decisionmaking process and create greater situational awareness prior to crews encountering these conditions?

General CROSBY. Currently, the Aviation Mission Planning System (AMPS) is utilized by almost every aviation platform as a mission planning and mission rehearsal tool prior to a flight. It uses maps and other geo-referenced imagery and databases correlated with Digital Terrain Elevation Data (DTED) data to depict terrain features and man-made obstacles which optimize the planning process. AMPS software additionally takes into account aircraft type and performance attributes as well as forecasted environmental conditions to determine expected performance characteristics for the proposed mission. AMPS currently provides no tool that fuses all of this data together for the express purpose of qualitatively assessing a helicopter landing zone with respect to the potential for Degraded Visual Environment (DVE).

While a qualitative assessment of a landing zone based on accurate and up-to-date data could be useful in determining if it is safe to land a rotary-wing aircraft, such an assessment performed in a mission-planning function would not necessarily decrease the impact of the DVE problem due to two major issues: the age and accuracy of the data, and the accuracy of Global Positioning System (GPS) systems. First, the age of database terrain and environmental data may result in substantial errors when relied upon during DVE, due to the fact that the terrain itself may have changed, or buildings, vehicles, and other obstacles may be in the landing zone. These changes would not appear in a database that is not often updated. Additionally, the typical DTED error is plus or minus 3.5 meters (m). Second, the relation of the aircraft to the ground in a DVE is determined solely by GPS. The accuracy of current military GPS systems is approximately plus or minus 6.5m. This could result in a total error of plus or minus 10m. While an error of 10m might not seem significant, it is considerable for an aircraft at low altitudes or transitioning to land. Mission planning represents a snap shot in time, and the available information at the time of planning may not represent the true nature of the landing environment for a number of reasons. Mission planning is critical in reducing risk, however, DVE is a real-time problem, and a pilot cannot be expected to rely solely on planning products during low-altitude operations in a DVE. The United States Army Program Executive Office Aviation Report and Recommendations on Terrain Awareness Aspects of Rotorcraft Mishaps in DVE speaks directly to these issues in section V paragraph C. on page 47.

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General KANE. Due to the dynamic nature of rotary-wing operations, specifically time-sensitive Special Operations, Personnel Recovery and Nuclear Support missions, aircrews land at unsurveyed and unimproved landing zones where Degraded Visual Environment conditions may be encountered. To mitigate this risk, the Air Force is pursuing several Service and Joint efforts to improve the Degraded Visual Environment and survivability for our vertical lift aircraft. Air Force efforts are focused across the spectrum from pre-mission planning tools to aircraft-specific systems that enable dynamic terminal area operations to unplanned landing zones. For the HH-60G we are installing an improved altitude hold and hover system and moving maps with digital terrain and elevation data. Additionally, flight testing will start in FY 14 for a 3D-Landing Zone technology that will "see-through" dust during take-offs and landings. The CV-22 currently has a robust enroute Degraded Visual Environment capability that includes digital terrain maps, heads-up displays, forward looking infrared (FLIR), automatic flight control approach, hover system, and a terrain following radar. Both the HH-60G and CV-22 have on board integrated systems that allow aircrew members to compute real-time power management calculations that incorporate aircraft performance parameters prior to take-off and landing. These systems allow aircrew to reconfirm and or update pre-mission

data. For the UH-1N we are planning a commercial-off-the-shelf terrain warning system.

A robust and thorough mission planning system, landing zone assessments and real-time mission management, coupled with Service and Joint collaboration, has significantly improved mission effectiveness and aircrew situational awareness.

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General JONES. Due to the dynamic nature of rotary-wing operations, specifically time-sensitive Special Operations, Personnel Recovery and Nuclear Support missions, aircrews land at unsurveyed and unimproved landing zones where Degraded Visual Environment conditions may be encountered. To mitigate this risk, the Air Force is pursuing several Service and Joint efforts to improve the Degraded Visual Environment and survivability for our vertical lift aircraft. Air Force efforts are focused across the spectrum from pre-mission planning tools to aircraft-specific systems that enable dynamic terminal area operations to unplanned landing zones. For the HH-60G we are installing an improved altitude hold and hover system and moving maps with digital terrain and elevation data. Additionally, flight testing will start in FY 14 for a 3D-Landing Zone technology that will "see-through" dust during take-offs and landings. The CV-22 currently has a robust enroute Degraded Visual Environment capability that includes digital terrain maps, heads-up displays, forward looking infrared (FLIR), automatic flight control approach, hover system, and a terrain following radar. Both the HH-60G and CV-22 have on board integrated systems that allow aircrew members to compute real-time power management calculations that incorporate aircraft performance parameters prior to take-off and landing. These systems allow aircrew to reconfirm and or update pre-mission data. For the UH-1N we are planning a commercial-off-the-shelf terrain warning system.

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