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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2019
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED FIFTEENTH CONGRESS
SECOND SESSION
—
SUBCOMMITTEE ON SEAPOWER AND
PROJECTION FORCES HEARING
ON
**DEPARTMENT OF THE AIR FORCE
FISCAL YEAR 2019 BUDGET REQUEST FOR
SEAPOWER AND PROJECTION FORCES**
—

HEARING HELD
MARCH 14, 2018



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**DEPARTMENT OF THE AIR FORCE FISCAL YEAR 2019
BUDGET REQUEST FOR SEAPOWER AND PROJECTION
FORCES**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES,
Washington, DC, Wednesday, March 14, 2018.

The subcommittee met, pursuant to notice, at 2:00 p.m. in room 2212, Rayburn House Office Building, Hon. Robert J. Wittman (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. ROBERT J. WITTMAN, A REPRESENTATIVE FROM VIRGINIA, CHAIRMAN, SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES

Mr. WITTMAN. The House Armed Services Subcommittee on Seapower and Projection Forces. Today the subcommittee convenes to receive testimony on the fiscal year 2019 Air Force budget request regarding bomber, tanker, and airlift acquisition programs.

The distinguished panel of Air Force leaders testifying before us today are the Honorable Dr. William Roper, Assistant Secretary of the Air Force for Acquisition; Lieutenant General Jerry D. Harris, U.S. Air Force Deputy Chief of Staff for Strategic Plans and Programs; and Lieutenant General Mark C. Nowland, U.S. Air Force Deputy Chief of Staff for Operations, Plans, and Requirements.

Gentlemen, thank you so much for being here with us today.

The fiscal year 2019 budget request for projection forces continues to modernize and recapitalize critical Air Force weapons systems. I am pleased to see increasing investments in the B-21 Raider bomber, and the high-visibility VC-25B Presidential Aircraft Recapitalization effort.

Also, this budget proposes funding to continue modernizing the legacy Guard and Reserve C-130H tactical airlift fleet.

Throughout the past year, in testimony to Congress, Air Force senior leadership indicated that the Air Force is one of the busiest, smallest, and oldest, and least ready fleets in our history. It is my firm conviction, in light of the threats posed by China, Russia, North Korea, and Iran, that we must provide the Air Force the resources it needs to fully support critical recapitalization programs.

With regard to bombers, the Air Force outlined its plan for its bomber fleet in the fiscal year 2019 budget submission. Under this plan, the B-52, the oldest bomber in the fleet, will remain on duty for the next few decades, while the newest B-2 and B-1 bombers will be retired.

As I have said, the B-52 is the workhorse of the fleet, and we understand too what it is capable of doing. And doing some service

life extension on it will make it an aircraft that will take us many years into the future.

I am interested to hear from the witnesses today about factors being used to make the bomber vector decisions in retiring the B-1 and B-2.

As for the B-21, I fully support this critical program and am pleased to see that we are moving forward with the project.

The B-21 will be needed for projecting power over long distances into denied environments in the future of warfare as it faces us in the era of great power competition. Timely delivery of the B-21 is necessary to ensure our national security. And while I believe that Northrop Grumman is doing a very good job at managing the risk across the entire portfolio, I look forward to assessing in better detail the B-21 program to ensure sufficient progress on both design and construction.

With regard to tankers, I am concerned that continued forecast delays for KC-46A deliveries, coupled with the Air Force's plan to begin retiring 47 KC-10A aircraft across the FYDP [Future Years Defense Program] beginning in fiscal year 2019, may add unacceptable risk to combatant commanders' ability to execute war plans.

In General McDew's testimony to my subcommittee last week he indicated "we already know the convergence of an aging air refueling fleet with protracted KC-46 production puts the joint force's ability to effectively execute war plans at risk." He went on to say "it is clear, the tanker fleet's end strength will require careful synchronization between KC-10 and KC-135 retirements, and KC-46 production and delivery to sustained current force projection capabilities."

I look forward to hearing your thoughts on this program and how the Air Force intends to manage the transition from KC-10A and KC-135 aircraft to the KC-46A. Furthermore, I look forward to hearing why Air Force believes robust investment into KC-46A is warranted considering continued delays in the program.

I am encouraged with the Air Force's sustained effort to ensure that its mobility aircraft will comply with the FAA-mandated [Federal Aviation Administration] NextGen [Next Generation] air traffic management standards by July 1, 2020, with the exception of a few aircraft that will be undergoing depot modifications. But I am becoming increasingly concerned about other military equities that may be impacted as we move to support the FAA mandate.

While I support the migration of our tankers and airlift assets to NextGen, I do worry about the lack of security protections associated with the bomber and fighter force structures. We need to carefully monitor this transition.

While I believe that the Air Force's fiscal year 2019 budget request continues to make up lost ground, I remain concerned about the Air Force's ability to fulfill combatant commander requirements given the shortfalls in strategic airlift, aerial refueling, and the increased risk posed by the complexities of managing the tanker and bomber transitions.

In the words of the immortal air power theorist General Giulio Douhet, "In order to assure an adequate national defense, it is necessary and sufficient to be in a position in case of war to conquer the command of air." Like Douhet, it is my firm conviction that we

need a strong Air Force equipped with the most capable aircraft that enable our highly skilled and motivated airmen to defend our great Nation.

Once again, I want to thank our witnesses for participating in our hearing this afternoon, and I look forward to discussing these important topics.

With that, I turn to my good friend and colleague, the ranking member of our subcommittee, Joe Courtney.

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

STATEMENT OF HON. JOE COURTNEY, A REPRESENTATIVE FROM CONNECTICUT, RANKING MEMBER, SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES

Mr. COURTNEY. Thank you, Mr. Chairman, and thank you to the witnesses for testifying today at the Seapower and Projection Forces Subcommittee.

We are obviously here today on the projection part of our portfolio. And again, we welcome the opportunity to discuss with Air Force leadership the bomber, tanker, and airlift platforms that ensure that we can respond anywhere at any time around the world.

The 2019 budget request for these programs reflects the challenging balancing act facing Air Force and the Congress. For instance, the budget continues significant investment in major replacement programs like the B-21 bomber and the KC-46 tanker. At the same time, a large portion of the request also covers a range of modernization efforts aimed at keeping older legacy bombers and tankers operational and relevant for years to come.

This is not an easy balance to maintain, and your input today will help our subcommittee evaluate whether we have—what we have right in this year's defense bill.

With that in mind, I want to quickly highlight a few areas of focus.

As I noted earlier, the 2019 budget continues significant and needed investment in the KC-46 tanker replacement. However, I remain concerned about additional delays in this high-priority program. Just last week, the Air Force announced the delivery of the first operational tankers may not occur until next year. I hope our witnesses today will explain how the Air Force is working to address the program's schedule and the impact of delays on the rest of the tanker fleet.

Another area of ongoing concern and bipartisan interest in our subcommittee is the modernization of our C-130H fleet. This subcommittee has led the way in moving upgrades like the Avionics Modernization Program, AMP, forward after years of delay. And I appreciate the Air Force's continued support for AMP in the 2019 budget.

However, I am disappointed that the budget does not fund other needed upgrades like new high-efficiency propellers and engines for this fleet. I look forward to exploring this issue more in our session today.

And lastly, I also hope that our witnesses will provide additional clarity into recent developments on the Air Force One replacement program. There have been very public and high-level pronounce-

ments about a deal to save \$1 billion on the new aircraft. Unfortunately, to date very little detail has been provided to our subcommittee or the American public about this arrangement.

At the same time, the Air Force is moving forward on costly sole-source contracts to sustain and upgrade the current Presidential aircraft. I believe our subcommittee deserves greater insight into what is happening with this program, as well as begin our work on this year's defense bill.

I have additional remarks but, again, time is the enemy here with votes about to take place. So I am just going to ask those be submitted for the record.

And again, thank you to the witnesses for being here today. We look forward to your testimony and questions.

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

Mr. WITTMAN. Without objection.

Dr. Roper, we will go to you. I understand that you will be giving the opening statement for the panel, and we turn now to you.

STATEMENT OF HON. WILLIAM B. ROPER, JR., ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION, HEADQUARTERS U.S. AIR FORCE; LT GEN JERRY D. HARRIS, JR., DEPUTY CHIEF OF STAFF FOR STRATEGIC PLANS AND PROGRAMS, HEADQUARTERS U.S. AIR FORCE; AND LT GEN MARK C. NOWLAND, USAF, DEPUTY CHIEF OF STAFF FOR OPERATIONS, PLANS AND REQUIREMENTS, HEADQUARTERS U.S. AIR FORCE

Dr. ROPER. Thank you, Chairman Wittman and Ranking Member Courtney and distinguished members of the subcommittee. We want to start by thanking you for the opportunity to be here, and for your support of U.S. Air Force, our airmen, and their families. It is much appreciated.

General Harris, General Nowland, and I have submitted a joint statement that we would like to be entered into the record. And I will provide a few brief opening remarks so that we can turn our focus to your questions later on.

Throughout our 70-year history in the Air Force, we have conceived, acquired, and operationalized some of the world's most high-tech systems. From jet engines to ICBMs [intercontinental ballistic missiles], to stealth, to satellite-guided bombs, to remotely piloted planes, and many things we cannot name, we have made science and technology the whetstone of the world's most lethal air force.

But despite our current lethality, 27 years of continuous combat operations have done more than just take a toll on airmen and equipment. It has allowed the national security environment to change, while our time, talent, and treasure were otherwise engaged.

I know the committee is well aware that many capabilities developed decades ago have been studied, copied, and, in many cases, exploited by adversaries. The new National Defense Strategy makes it clear we must pick up the gauntlet and modernize the force. We are committed to this task, and to doing it cost effectively.

I know the subcommittee is also aware of the warfighting and deterrence advantages that unmatched bombers, tankers, and airlift bring to the joint force. This is an awesome portfolio of capabilities, giving commanders global options at the speed of need.

Let me give you a few supporting facts. Last year our bombers flew 650 missions in the Indo-Pacific and European theaters, strengthening security and assuring allies and partners during troubling times. We transported and delivered nearly 1 million personnel, 738 million pounds of warfighting equipment and humanitarian supplies, and over 1 billion pounds of fuel in-flight.

The military implication of these numbers speaks for itself. To maintain this advantage, the fiscal year 2019 budget submission is a balance between readiness and needed modernization. This is no easy task, being ready for today's war, while preparing for tomorrow's. But we look forward to sharing steps we are taking.

We also applaud your recent efforts to lift the sequestration caps for fiscal year 2019 and fiscal year 2018. Stable and timely budgets devoid of continuing resolutions and budget caps are absolutely necessary to build, sustain, and operate the Air Force this country needs and deserves.

Thank you again for your continued support of your Air Force, and we look forward to your questions today.

[The joint prepared statement of Dr. Roper, General Harris, and General Nowland can be found in the Appendix on page 33.]

Mr. WITTMAN. Thank you, Dr. Roper. I am going to yield. I will provide my questions a little bit later, I will yield to my colleague, Mr. Courtney.

Mr. COURTNEY. Great. Thank you, Mr. Chairman. And again, I will be brief because I know we have a lot of members here.

Again, I would like to just go back for a second to the C-130H program, which—again, this subcommittee, over the last two or three NDAA's [National Defense Authorization Acts] has been very deeply involved, in terms of trying to balance all of the different stakeholders in terms of that and, again, on a very bipartisan basis.

Again, just for the record, last year Air Force officials testified that the first part of the Avionics Modernization Program was on track to be in compliance with FAA and international airspace requirements before the 2020 deadline. I was just wondering, again, for the record, just want to confirm that we are still moving forward in terms of achieving that goal.

General HARRIS. We are.

Mr. COURTNEY. Thank you. Okay. The second part of AMP was to be focused on longer-term cockpit upgrades. And again, there is about \$400 million in the budget to conduct research and development before beginning that procurement.

Last week, Dr. Roper, you came over and testified, you know, about the fact that, you know, we, as part of acquisition reform, should be using available technology and open new opportunities for the Air Force to leverage commercial technology at commercial speed.

I mean I am not sure how much you have had a chance to sort of, you know, dig into this program, but it does seem like the AMP 2 upgrade in the cockpits is a perfect example of a place where we

could maybe accelerate that process, and probably save some money, as opposed to sort of what is in the budget here today. You know, we are talking about upgrades that, again, are happening in, you know, commercial areas, as well as, you know, other parts of the world.

And I was wondering if you could sort of comment on that.

Dr. ROPER. Of course, Congressman. I think what you are seeing in the modernization efforts is we have got planes with good bones, but it is time to work on the innards, on the networking, on the enablers that allow them to be so potent.

Whenever you are dealing with sensing technology or networking technology, you really are playing into commercial technologies that can be a large contributor. And so, it is going to be a major role for me in this position to make sure that we are adopting the best of breed from commercial tech. And I think these programs are no exception.

I think the general caution—something we are going to have to learn across the Air Force—is how do we use commercial tech safely. We can't put people up in airplanes if there is a cyber vulnerability, or something that might be compromised on the battlefield. I don't think that is insurmountable. I don't think it should be cold water on the issue. It is just a different kind of design philosophy, to figure out how to use something that you didn't control during its whole life. And that is not just going to be part of the airlift or the bomber portfolio; I think that is going to be across the Air Force, including the space portfolio. So just general lessons to learn, sir.

Mr. COURTNEY. Good. And, you know, as I think we discussed offline earlier, I mean, this subcommittee is very willing to embrace, you know, ways to create authorities, to promote more efficiencies and, you know, save speed, in terms of programs. I think this is one that you really should maybe put on the dance card, in terms of, you know, possibilities where you can achieve those goals that you articulated, again, last week.

The last question I have is on KC-46. As I mentioned, you know, we are looking at another sort of delay that seems to be sort of causing—being caused by the testing part of the pipeline that is there. And I mean it seems like the production side of it is moving along, nonetheless.

And I just wonder if you could sort of comment in terms of how we can—whether or not we can sort of get this centipede sort of moving along, rather than having a—sort of it bunched up, you know, after the planes are coming out of the factory.

Dr. ROPER. Yes, sir. I have been spending a lot of time on KC-46. And I share your concern. This is an important year for the program. And even though it is a fixed-price contract, and any of the delays and issues that we see are not things that the taxpayer is paying for, we are still taking time away from warfighters if we delay.

The big thing on any program like this is you have got to be out testing. And so, the delays in getting FAA certifications, the supplemental certification and then the military certification, is a concern to me. Because having those certifications will allow us to do more aggressive flight testing. And if you have ever done an engi-

neering program, stuff is going to go wrong, that is just the nature of the beast. You tackle that by testing early, putting your finger on problems, and being able to retire them.

So the fact that there are issues in the program is less concerning to me. What will concern me during this year, if issues don't get retired quickly—so it is the speed at which they get retired that is going to be a key metric for me.

If you step back from the program, though, there are a lot of requirements that have to be met. I think it is 738. We are about 30 percent through them, roughly, to date. So there is a lot that has to happen this year to deliver on time. We have a great team working it.

You asked earlier what is the government doing to help. We are trying to make every flexibility available, so that Boeing, which is being a great partner for us, they are committed to the program—we are trying to give them the flexibility to prioritize task in the program, so that they can tackle the biggest risk as early as possible. So risk burn-down-driven program. So that is something that we can do on the government side, and we are doing.

And there will be more to follow on this program. So I expect to stay in close connection with this committee on how we are doing.

Mr. COURTNEY. Great, thank you. I yield back.

Mr. WITTMAN. Thank you, Mr. Courtney. We will now go to Mr. Byrne.

Mr. BYRNE. Thank you, Mr. Chairman. This is a question for the two generals.

The Nuclear Posture Review states the necessity of maintaining the nuclear triad, and our bomber fleet remains a key element of that plan.

In this year's Presidential budget request, the Air Force outlined its plan that calls for the retention of the B-52 and eventual retirement of the B-1 and B-2 bombers.

Can you both explain the logic associated with B-1 and B-2 retirement, and what factors led the Air Force to the decision to retain the service's oldest bomber, the B-52?

General HARRIS. Yes, sir. If you don't mind, I will start with that.

Mr. BYRNE. Sure.

General HARRIS. So thank you, that is a great question. And we actually get that one a lot, based on the age of the platform.

But we based that decision on independent studies, and then multiple factors when it came to why we got to the selection of keeping the B-52. Those factors include our maintenance and our sustainment capabilities and the metrics that are associated with those, such as aircraft availability, downtime for maintenance, or downtime for supply, and the cost in terms of maintenance man-hours per flight hour. And the B-52 was the leading candidate for the keeping of the current fleet that we have.

So as we look forward into B-21 production and deliveries, you will see a phase-out between the B-1s and the B-2s to associate us keeping roughly 175 to 170-ish type bombers, between the B-21 and the B-52.

General NOWLAND. Yes, if I may add?

Mr. BYRNE. Yes.

General NOWLAND. It is a great question. The future of the Air Force is a combination of penetrating, non-penetrating, manned, unmanned, stand-off, penetrate, and drop from above. So the combination of the strategy of a B-52 with stand-off munitions and its capacity with a B-21 for the future gives us the warfighting punch that we think we will need, as we look to the future against China and Russia and the threats that we need to prepare for.

Mr. BYRNE. Well, let me just follow up on that for a second. I know all of us are re-evaluating things in light of changes in what we have seen as the posture by both China and Russia. And I don't want you to go into anything that is classified, but was that in part what was driving your decision?

General HARRIS. It was. That was definitely a part of it. And we allowed the National Defense Strategy that was recently published to help drive that.

Mr. BYRNE. I see that, and I appreciate your explanation. That does remove just a source of curiosity for me to understand it.

Dr. Roper, just a quick comment to you. It was 10 years ago last month that the tanker project was originally awarded to another company other than Boeing. We have American aircraft that are being refueled by that company's tankers. We are 10 years later, and the tanker we awarded to Boeing can't refuel our tankers yet.

So I have concerns that this is going to continue to be a problem, that the assurances we have gotten before about "No, it is going to be this time, no, it is going to be this time" are just going to continue. Relieve me of my concerns, please, sir.

Dr. ROPER. Congressman, I wanted to start by saying we really appreciate the acquisition reforms that this committee and others in Congress have championed, and I think they will go a long way to help get control of acquisition.

Just to give you a little bit of insight to what running a program would be like in the past is you would have the rein of the horse, and then there would be 100 other people in the Pentagon holding the other. And the idea that you could somehow drive that horse straight to destination is just really hard to imagine.

By giving authority back to the Air Force, you really are able to hold people accountable again, look at me and say why is this program not on track.

Now, I wish we had a time machine and could go back in time and fix some of the program issues that we have had. And we are going to do our very best to fix it forward and play the ball as it lies. But I think on the new programs that we are starting to use these authorities on, we are going to see a lot more prototyping, which is a big thing for me. Don't let risks snowball. Go out and start building early. Put your finger on hard-to-do things.

The Air Force has a great history of doing that. Back during its experimental plane heyday, built a lot of advanced technology, and it had the discipline to only put one new hard thing in each new plane. And if you couldn't do it, then you needed to keep focusing on that thing because that is where your risk was.

So I think that is—that discipline is going to come back, because you have given us the authority to implement it again, that scale.

Mr. BYRNE. Well, I appreciate your comments. I certainly look forward—you can't go back in a time machine, I get that. But you

can learn from your past mistakes and make sure you don't replicate them in the future.

And with that, Mr. Chairman, I yield back.

Mr. WITTMAN. Thank you, Mr. Byrne. We will now go to Ms. Bordallo. And after Ms. Bordallo finishes with her line of questioning, we will adjourn for votes and then return.

Ms. BORDALLO. Well, thank you, Mr. Chairman. I only have one question, so I guess I will meet the deadline.

[Laughter.]

Ms. BORDALLO. Gentlemen, thank you all for being here today, and thank you for your service.

We have been told that the current U.S. TRANSCOM [United States Transportation Command] requirements for air refueling tankers is 567 aircraft. But the service is only fielding 455 tankers to meet the warfighting requirements.

So, in lieu of the results of the command's mobility capabilities requirement study, can one of you speak to the service's plan to balance KC-46 production with the retirement of the KC-135s to meet mission requirements? And furthermore, how do you intend to work through the basing requirements for a larger fleet?

General HARRIS. Yes, ma'am. I would be happy to start with that and see if my colleagues have more to add. So thank you.

We are looking at the study for the KC-46 and what it brings to us, and we have determined that the best platform for us to retire is actually the KC-10. And our—you are correct, we do have 455 of the tankers in the fleet now, and our intent is to grow to 479. So you will see that, as the KC-46s that Dr. Roper has been talking about add to our fleet, we will stand down KC-10s, but we will actually grow our 135s.

So as we replace the 135s initially, they will move to other units, and we will preserve those tankers to actually grow our fleet, adding 25 to that capability.

When it comes to TRANSCOM and the requirements, we look at this fleet as one of the things that separates us from other countries' air forces, and it allows us to be that expeditionary force and take the fight to our adversaries. And they are extremely important to what we do, but we are comfortable with the moderate-level risk, once we grow that 479 with a mix of KC-46As and 135Rs, that we will have the fleet we need to meet the combatant commanders' intent.

Ms. BORDALLO. Any other—

General NOWLAND. Congresswoman Bordallo, hafa adai.

Ms. BORDALLO. Hafa adai.

General NOWLAND. It is a great question, particularly from Guam. As you know, power projection, our tankers, are key towards this. We give three million pounds of gas a day right now in the Central Command area of responsibility.

The key to it, though, is managing the requirements, working the—what we call the schedule. And we have actually made some advancements with that. DIUx [Defense Innovation Unit-Experimental] created a tanker tool for us that allows us to schedule a little bit more efficiently.

And then the other reality, ma'am, is manning those airplanes. You can have all those airplanes, but because of the nature of our

fleet, if we were going to have to use all of those—which they surge to do, but over a sustained period of time—would probably require—would require a partial mobilization to be able to do all of that at one time.

Ms. BORDALLO. Thank you, and hafa adai to you, too. And I yield back, Mr. Chairman.

Mr. WITTMAN. Thank you, Ms. Bordallo. We will recess for the votes.

I would ask members, after the third vote, to return back here, and we will resume the line of questioning.

[Recess.]

Mr. WITTMAN. We are going to reconvene and continue our line of questioning. And we will go to Mr. Norcross.

Mr. NORCROSS. Thank you, Chairman. I want to follow up on the discussion that two or three other members have already talked about, and that is our tankers.

The original date that we expected the delivery to start, when this began, what year?

Dr. ROPER. So, Congressman, I will take that one for the record. I know we are behind, but I want to get you the precise date.

[The information referred to can be found in the Appendix on page 53.]

Mr. NORCROSS. Give me a year.

Dr. ROPER. We are years behind.

Mr. NORCROSS. Give me a decade?

Dr. ROPER. I mean it is one of the many programs where we have been delayed, sir. So yes, it is years of time. And I will get you the precise number for the record, sir.

Mr. NORCROSS. So you went through a discussion on how we used to embrace change, but at some point you made a decision to go with a program the way it is, no major changes.

As I understand it, with the new tanker, the boom camera system seems to be top of the issue board. Would you agree to that?

Dr. ROPER. Yes, sir. We are having both issues with the center-line drogue, as well as the remote visual system, which is what allows the operator to determine if the drogue or the boom is working. If you can't see, then you can't control it properly. So that is correct, sir.

Mr. NORCROSS. When was that spec changed to go from the original camera system?

Dr. ROPER. So, sir, the requirements, to my knowledge, the requirements have not changed. As the E&D [engineering and design] contract with Boeing was let, it had requirements. There are 738, to my knowledge, that have to be met. They include all aspects of operation, including allowing the operator to be able to see appropriately, allowing the drogue to be employed appropriately. And so it is the development testing that is proving that some of the choices that have been made in the program are not meeting those requirements.

I mentioned a little earlier in testimony, issues and programs don't give me concern, per se. Most programs have issues. What I am going to be tracking very carefully as I start this job is how long does it take issues to be retired. If you are designing correctly,

if you are doing good engineering, you find something, you should be able to fix it quickly because you have designed for it.

And so, these new issues that have appeared, I am tracking them. And what I am going to be very focused on is how long do they persist. And if they persist for a long time, then that is indicative of a problem with the program, sir.

Mr. NORCROSS. So when they finally come through the delivery date, are you going to have the personnel to fly them, maintain them, and the construction done?

And—because as I go out to two of the bases, they are not ready for it.

General HARRIS. Sir, I will take that one. We are not starting this as a new fleet. So the KC-46, as it comes on, will replace current squadrons. So the initial ones going to the trainers, once we are done with the testing of these, they will start to work their way through probably a normal contract type of initial training, and then start to do the—the formal training unit themselves will pick that up, and then we will work through it.

Because these are all replacements, it will take us a while, but they will replace squadrons of KC-10s and KC-135s, and we do have those people onboard already. Yes, sir.

Mr. NORCROSS. Trained in the KC-46s?

General HARRIS. No, sir, they are not—that is what I am saying. When we get the first one to start that training, we will start with our formal training unit, our schoolhouse.

Mr. NORCROSS. Right.

General HARRIS. They will build up, and then they will become the instructors with an assist from the contract team, as it is written—

Mr. NORCROSS. So you have adjusted your schedule—the construction of the new facilities and the personnel to reflect—

General HARRIS. We are staying on time with those, because if the airplanes come to us we don't want to be late with those facilities. So we are continuing to push forward with the MILCON [military construction] and the people that will be used—or put into the effort.

Dr. ROPER. Congressman, you are right to point out that the delivery of the tankers alone impacts a lot of other things. It impacts training. It also impacts how long we have to keep the KC-10 and the KC-35s flying, right?

So there are a lot of coupled factors that touch that tanker. So it is high priority, and I think, for me, if these new deficiencies are not retired quickly, then it is going to make me be very concerned about hitting our delivery date this year. This is a very critical year for the tanker.

Mr. NORCROSS. I agree. I yield back the balance.

Mr. WITTMAN. Thank you, Mr. Norcross. We will now go to Mr. Conaway.

Mr. CONAWAY. Thank you, Mr. Chairman.

The Air Force's 2019 budget called for the retention of B-52s and ultimate retirements of B-1s, B-2s, once the B-21 is in base. Can you talk to us about the mechanics for how that decision came about, in terms of the retirements of the B-1s and B-2s?

And then have basing decisions been made as to where the B-21s are going to be based?

General HARRIS. Sir, I will start with that, if you don't mind. The B-52 was selected based on a lot of factors and an independent study done within our Air Force A9 [Studies, Analysis and Assessments] team. And those factors looked at the maintenance and sustainment metrics of the platforms themselves, the aircraft availability, the maintenance availability versus supply rates, and the B-52 was the winner of that.

So that was the selection that, when we applied what the airplane can do in the near future, when we looked at the B-2, the B-1, and the B-52, as paired with the B-21, and then applied the National Defense Strategy to this, it was the clear winner for us.

Mr. CONAWAY. So can you talk to us, though, about you—you know, the basing decisions on the B-21? Are you just going to simply replace the B-1s, B-2s with B-21s in its place? You going to move around the world? What are you going to do with them?

General HARRIS. Yes, sir. Based on the strategic capabilities of the bomber, they are all continental-based. So we have them forward-deployed, but for temporary status.

So I would expect that, if you are flying bombers now, a B-1 or a B-2, in the future you will probably—

Mr. CONAWAY. Say out of Dyess Air Force Base.

General HARRIS [continuing]. B-21s, yes, sir.

Mr. CONAWAY. Okay.

General HARRIS. And that is where the school is for one of those platforms.

Mr. CONAWAY. Right.

General HARRIS. We will probably start there. But we are working through the strategic basing decision, and we have not released any of those locations. We are just looking at it from those are the locations currently flying bombers, have the facilities to support bombers.

Mr. CONAWAY. All right, thank you, yield back.

General HARRIS. Yes, sir.

Mr. WITTMAN. Thank you, Mr. Conaway.

I want to get the panelists' perspective on both the new national defense study and then some of the comments made by General McDew. If you combine those two together, it appears as though the Air Force is looking to increase its airlift capacity and its tanking capacity over that which you have today. So, additional aircraft over which you have today.

And I know the mobility capability requirements study is going to come out this fall to look at what the requirement would be into the future, and what you need for the entire demand signal that is going to come your way.

In looking at where that is, it appears to me as though the place where you will find yourself is increased airlift and tanker force structure. That is, a larger number of aircraft.

So the question then becomes, with the projected numbers of tankers that you will build, and lift capacity that you will build, it seems like your number—if you completely retire existing aircraft, it seems like your number is going to be lower, rather than higher.

So how do you reconcile where you end up with total force structure for lift and for tanker based on where the build ends up, and completely retiring both KC-10, KC-135 aircraft, as well as transitioning to the—both the tactical lift we have in C-130s, but also C-17 line is done, you know, we have some demand going on out there, we have some C-5s that are at the boneyard.

So the question then becomes, with the demand signal increasing, and with the era of great power competition, give us your perspective on what appears to be a demand signal for increased lift and tanker force structure.

General HARRIS. Yes, sir. That is a very good question that—it will take a couple of us to answer that, I suspect. If you don't mind—

Mr. WITTMAN. Sure.

General HARRIS [continuing]. We will do that. Let me start with the tankers.

We are not retiring all of the KC-135s. When we have the complete fleet of KC-46As, we will have retired all of the KC-10s and some of the 135s. So we will have a fleet of 300 135s and 179 KC-46s. That gets us to our fleet of 479, as compared to today 455. So that tanker fleet is growing.

To help us with that, we are also reducing the requirements. Because as we go through and modernize the B-52, the new engines will actually require a significant—the improvements we are getting out of the new technology will significantly reduce the fuel required for that platform to fly. So while we grow the platforms and the tankers, we will also decrease the requirement, which helps us solve some of those issues.

From a bomber perspective, retiring the B-1 and the—actually, you didn't talk bombers, you—STRAT [strategic] lift, I am sorry, so C-5s. To help us with our C-5 lift, we had—initially, for budget reasons, we had moved 8 C-5s into BAI [backup-aircraft inventory] status, which means we still had the airplanes flyable on the flight line, but we didn't have the ops maintenance and the money behind them to fly them. We just rotated them through.

We are pulling two out last year, two again this year with our fiscal year 2019 proposal, and we intend to do two each of the next 2 years—basically, have an additional squadron push back out into the force to have additional C-5s, which is one of our best airlifters.

Mr. WITTMAN. Yes.

General HARRIS. We will marry that up with the C-17 fleet—we have 222 aircraft—and then a smaller C-130 fleet, which should meet our TAC [tactical] lift.

Mr. WITTMAN. Yes.

General HARRIS. So, at this point, when we look at what we are doing with our strategic lift, we are fairly comfortable with where we are headed on the operations plan, but we do have a study that is—the mobility capabilities and requirements study is ongoing and we will address through that, if we need to, when it completes here in several months.

Mr. WITTMAN. Got it.

General.

General NOWLAND. Sir, if I may add, you know, as the operations, we are always looking at our plans. And you are absolutely correct, there is always stress on our mobility and our tanker fleet.

Mr. WITTMAN. Yes.

General NOWLAND. Because as we look at the National Defense Strategy, everybody wants it quicker and sooner and more rapid, so concepts of operation are super important, as we think about how we mix the future force mix. And as General Harris said, modernization reduces some, but then you are still going to get other people that want to fill in with other capability.

So, working with TRANSCOM and General Everhart, who is our Air Mobility Command commander, is really looking at this hard, because command and controlling this and scheduling it really becomes the secret sauce of how you do it, because there is going to be a lot of friction as you think about the distances that we have to cover in a new National Defense Strategy [NDS].

Mr. WITTMAN. It certainly seems like the demand signal is going to continue to increase, especially based on NDS. Give me this perspective: The KC-10As are scheduled—a group of them are scheduled for retirement in fiscal year 2019. As KC-46A moves to the right, it seems like you are going to have a gap there.

So tell me what the scheduling happens if KC-46A gets pushed to the right, and what the scheduling is for retirement of KC-10s.

General HARRIS. Sir, we had that study ongoing, but I fully expect the requirements levied on us by the TRANSCOM commander will force us to readdress our retirement schedule. If we are late on delivery, I would expect we would have a similar delay in retirement of the aircraft, so that we stay at our min [minimum] that we have now, but we intend to grow the fleet, rather than actually get smaller in that fleet.

Mr. WITTMAN. And in your plan, too, do you address the issue of attrition? We all talk about our fighting platforms in the air and on the sea, operating in contested environments. And the days of us being able to go in and gain air superiority in a day or two and then fly unimpeded in that airspace is a thing of the past.

So if our lift is going to be operating in contested airspace, if our tankers are going to be operating in contested airspace, being able to put it—be put at risk at long distances, how do you factor for attrition, and how do you factor for support for those aircraft? Because, again, that is the critical link to be able to fight your way in.

So give me that perspective about how the plan considers that.

General HARRIS. So, expect each one of us to bounce through on this question, also.

Mr. WITTMAN. Yes, please.

General HARRIS. But certainly, Chairman, there is risk associated with this. We have BAI, or battlefield interdiction—or attrition aircraft within each of the squadrons.

Mr. WITTMAN. Okay.

General HARRIS. It is normally about a 10 percent level. So we have some initially.

As you are aware, in our boneyard and different types of storage, we also have C-5s. We have other aircraft that are there. Part of our concern for our strategic lifters, other than what we have in

the boneyard, we don't have an open line. And we hear that regularly as a concern: You are not buying any cargo aircraft right now.

Well, to be honest, in a way, we are. The KC-46 is a dual-role aircraft. We intend to use them fully as a tanker, but with a dual-role capability. They do bring to us a capability to have strict cargo, if necessary. And that is an open line. So that is one of the things that we can look at.

And we are also working on the fighter—I am sorry, the next-generation air dominance portion to be able to make sure that we can operate and survive in that contested airspace, as you talked about, before we bring those aircraft forward.

Mr. WITTMAN. Good, very good. Thank you.

Dr. ROPER. Congressman, I think the point about having enough aircraft available is extremely important. And as a mathematician coming into this job, the number that we so often talk about are the number of aircraft. But the one that concerns me the most are the availability.

Mr. WITTMAN. Yes.

Dr. ROPER. So I am starting to read aircraft availability reports. And, you know, it is shocking to see some of the issues that we are having, in getting planes up in the air.

So the questions I have been asking as an acquisition person is where is our investment in research and development to go after sustainment and maintenance, where we are spending most of our budget. I think it is an area that we can improve on in the Air Force. We are spending most of our money there. There are many commercial practices that could be applied that we should be applying.

Mr. WITTMAN. Yes.

Mr. ROPER. I brought a 3D printed part from a C-5 today, which shuts off a valve on the outside of the plane. I am seeing little efforts like this across the Air Force, but I don't see the enterprise effort. And so that is one of the areas that I am going to be interested to work with Air Force leadership and go after that part of the aircraft availability equation.

Mr. WITTMAN. Yes, I think that is key.

Lieutenant General Nowland.

General NOWLAND. Back to concepts of operation, one of the advantages of the KC-46, our chief says the future battlefield we need to be networked, we need to share, and we need to learn.

So as we look at our fleet, some of the capabilities that we will bring on a KC-46 will enhance the situational awareness of the overall joint force commander, which will then allow us to adjust our concept a little bit so that when we get into that contested environment we are sharing greater information to improve the survivability and the resiliency of our operation.

Mr. WITTMAN. Sure. I think those are all important points as we look at, you know, how we operate in the future in both a strategically challenging environment, but also a resource-challenged environment, to do all that we can there.

I think the sustainability idea, too, and looking at life-cycle costs, looking at best value in purchasing—not low price, technically acceptable—and, as you know, we made a big change last year in

how acquisition takes place with that, and really minimizing the classes where we use LPTA [lowest price technically acceptable].

Listen, LPTA may be great for buying jet fuel and toilet paper, but for advanced systems in service, it is probably not the best way to go about it. So I appreciate you all doing that, because there are certainly some models out there—the airlines are tremendously effective in sustaining operations and making sure that they don't miss a minute of avoidable flight time, because when that aircraft is on the ground it is not generating revenue. And if we look at it the same way in seeing if our aircraft aren't generating sortie capability or mission capability, then we are missing out on what we have invested in. So I think that is the right way to look at it.

Gentlemen, thank you. We will now go to Mr. Garamendi.

Mr. GARAMENDI. Thank you, Mr. Chairman. And gentlemen, thank you very much for the testimony thus far. I want to follow up on some of this KC-10 issues. And specifically, this—the chairman was talking about attrition. And I think you said BAI, which was a new term for me. But I think I understand what it is.

The Air Force intends to recapitalize the KC-10 fleet as part of its legacy tanker recapitalization strategy, with retirements beginning in 2019. Representing Travis Air Force Base, I have a long-time interest in this issue.

Can you explain what that sentence means?

General HARRIS. Yes, sir. Congressman, had the KC-46A been delivering on time, we would have retired KC-10s just in time to receive the KC-46s at that base from the selection that has been made. Now that we are seeing the delays in those deliveries, we fully expect to actually slow down our retirement plans. We are going through a study to make sure that it is going to tell us—but 455 tankers with the throw weight that they can get, number of booms downrange, along with the number of gas, KC-10 is one of our best airplanes for that. And we intend to make sure that we are not just retiring it, but we are replacing it with KC-46As.

Mr. GARAMENDI. Given your testimony, given that it is public, I expect I am going to get a question from Fairfield, California. Has the beddown of the 46 timing changed at all?

General HARRIS. The timing beddown has changed only based on the delivery, sir. So if we don't have the aircraft to bed them down, then yes, it will have changed. But we are still working through the actual timing, as it slips.

Mr. GARAMENDI. I agree with one thing that—with all that you are saying. But obviously, concerns about the KC-46 and its availability, or its arrival.

The KC-10 is a spectacular airplane. And it seems as though the recapitalization means that this airplane is going to be around somewhere, not in a boneyard, but somewhere probably waiting to be deployed. Is that a strategy that is going to carry forward for the—assuming the KC-46 comes on, KC-10s go somewhere?

General HARRIS. No, sir. We do intend to retire the KC-10. We are one of the—there is only two other organizations in the world still flying that aircraft, and the parts availability are extremely hard to get. And the operating cost and the maintenance cost are not in our best interest. So—

Mr. GARAMENDI. Dr. Roper has his additive machine there.

[Laughter.]

General HARRIS. Yes, sir. He does.

Mr. GARAMENDI. It might be the only way. Okay. I appreciate that.

What is the range of the B-21?

Dr. ROPER. Congressman, we would be happy to discuss the B-21 with you in a closed session. But for any of its performance characteristics, they are just not things we can discuss in an open hearing.

Mr. GARAMENDI. Fair enough. I probably have other questions, but I will yield back at this point.

Mr. WITTMAN. Thank you, Mr. Garamendi. We will now go to Mrs. Hartzler.

Mrs. HARTZLER. Good afternoon, gentlemen. It is good to see you again. As you know, I have the privilege of representing the Whiteman Air Force Base, home of the B-2 stealth bomber, which is the only bomber with the A2/AD [anti-access/area denial] capability, as well as the most flexible leg in our nuclear triad.

And the Air Force's fiscal year 2019 budget proposal eliminated funding for the B-2 Advanced Extremely High Frequency [AEHF] satellite communications program, which would have provided the B-2 two-way, high-speed survivable communications during A2/AD operations. And while I fully support the recapitalization of the bomber fleet with the B-21 bomber, the B-2 must also continue to be modernized to mitigate capability and capacity gaps in the near to mid-term.

So, in light of the termination of the B-2 AEHF program, what is the Air Force doing to ensure communications with the B-2 remain viable in A2/AD environments?

General HARRIS. Ma'am, if you don't mind, I will start with that. Great question, and clearly you are tied in with your community.

The B-2 is an awesome aircraft that is capable of doing that penetration support. This particular radio is still a long way away, and our concern is, had we continued funding it the way it was, it would not have delivered until 2026 to 2028 timeframe with our bomber vector that we were planning to retire it just a few years later.

In accordance with the National Defense Strategy that was just published, this is one of the areas that we looked to take some risk on communications, because we will continue to modify the aircraft to make sure that it has the survivability it needs to be fully viable through that period. And we do have survivable radio connectivity using different system appropriate on that airplane that we didn't think a second one that delivered so late in its life span would be the right effect for us.

Mrs. HARTZLER. And that was going to be my follow-up question. Can you expound on that a little bit?

So you have an alternative secure communication solution to replace that to help it go ahead and carry out to the end of its life?

General HARRIS. Yes, ma'am. This—the radio you are talking about is the secure EHF [extremely high frequency]. That would have been the second one to deliver. The first one we are looking at is an LF/VLF [low frequency/very low frequency] system that

will deliver before, and actually give the capability that we have been missing for a while.

So when we looked at it from a risk perspective, having at least one assured com in there so that we can have the communications required for this in a nuclear role that is survivable in that type of an environment we think will be sufficient for the life span of that aircraft.

Mrs. HARTZLER. And when will this LF/VLF be added?

Dr. ROPER. So, ma'am, I will get you a firm date on the fielding date. The first money for it comes in place in our fiscal year 2019 budget.

[The information referred to can be found in the Appendix on page 53.]

Dr. ROPER. And just to speak a little more broadly about B-2 and the 2019 budget, it is an important system. It is going to be an important system for us until the B-21 fields. And so the big workhorse in our budget regarding the B-2 is the defense management system, which is a large program about \$1.3 billion over the FYDP, and it is meant to ensure that the B-2 maintains its ability to go into the most denied spaces of the world and be able to do its power projection mission.

So it is not neglected, we are just focusing on the things that we think are most relevant in the interim period between now and the B-21 fielding.

Mrs. HARTZLER. Yes, that is good to know. I was pleased to see the new start in the fiscal year 2019 proposal for the radar-aided targeting system, or RATS, software upgrade. What is the timeline for the RATS upgrade? And when can we expect to see it fielded in the B-2?

Dr. ROPER. So, ma'am, the RATS has about \$43 million in our fiscal year 2019 budget. Again, I will get you the firm date for the record, but I believe it is a 2- or 3-year program. But expect a firm date from me on that. It is an important part of the modernization effort to make sure the B-2 maintains its penetration capabilities, communication capabilities, and sensing capabilities into the future.

[The information referred to can be found in the Appendix on page 53.]

Mrs. HARTZLER. Yes, very, very important aircraft. I very much appreciate your acknowledgment of that and the steps that you are taking to keep it viable as long as possible, because our Nation may need it at any point.

General Nowland, when you testified before the Readiness Subcommittee I asked a question about the bomber vector, and you assured me that the Air Force is working to avoid a bomber dip, or a capability gap with the fleet. Can you discuss more about the Air Force's decision to re-engine the B-52, and what would happen to the overall bomber fleet if we do not move forward with the plans to re-engine the aircraft?

General NOWLAND. Ma'am, a fantastic question. The bombers are so important towards our overall concept of operations of how we support the joint fight. The B-52 re-engine is really good news for the Air Force, in my opinion.

It is going to save us fuel, it is going to give us increased capability with the sense of that extended range that you are going to get by the fuel savings. And it is going to give us more reliability, because the engines, as we move—the old engines, obviously, are hard to maintain, so hopefully it will reduce our amount of maintenance, will increase our mission capable rate, which will get us more sorties as we move forward.

So it is a really positive story, and I think Dr. Roper has got a great strategy on how we will prototype, and I will pass it over to Dr. Roper.

Dr. ROPER. So, Congresswoman, it is—the B-52 is a great example of being able to leverage work in commercial industry to help us in the military. The airline industry is booming right now. Engines are a big focus. Fuel efficiency is a big focus in the commercial world. And, of course, we want to put back in all of the capability that the current B-52 has.

But as the general has clearly articulated, there is a chance to do something big on fuel savings, which aren't just saving money for the Air Force, it is operational flexibility, it is extended range.

And I would also like to mention, given that we are talking tankers, it is a lot less time on tanking emissions. So benefits across the board.

The authorities that Congress has given us gives us a lot more opportunities to prototype things before we commit to the full program of record. I think B-52 re-engining is a great example of an opportunity to get out, to try something, and to fly before we buy it. And if we are buying it having demonstrated those fuel efficiencies, then we know we are making a smart decision for the future.

Mrs. HARTZLER. Sounds great. Thank you. I yield back.

Mr. WITTMAN. Thank you, Mrs. Hartzler.

Mr. GARAMENDI, additional questions?

Mr. GARAMENDI. To follow up on the B-52, are we developing a new engine or an engine that exists somewhere out there?

Dr. ROPER. So, sir, we have all options on the table. But my preferred option, moving into our acquisition strategy, is to leverage commercial. That was a big thrust for me in my previous job. If it is available in commercial industry, it has got their research and development in it, then we should begin by trying to leverage what they have done, as opposed to rebuild something ourselves.

Mr. GARAMENDI. And where are you in achieving your goal?

Dr. ROPER. So, sir, this will be an important year. We are still pre-milestone B in the re-engining, so this is the year that we should move into a formal acquisition strategy. I am working with the B-52 re-engining team, and I expect to have them on their acquisition path within the next quarter of this year.

Mr. GARAMENDI. I certainly agree with your goal of using a commercially available engine, if it is at all possible.

Dr. ROPER. Yes, sir. I just consider that just ground-rule acquisition practice, that if you can buy it from industry and there is not a national security reason why you can't, then you should.

Mr. GARAMENDI. And when will you know?

Dr. ROPER. So, sir, the team is going through different engine options as we look through, you know, options for potential source se-

lection. And so there will be more to follow on that. But there is a little more work to do to make sure that we do the right decision and right choice.

Mr. GARAMENDI. I asked you a four-letter question. When?

Dr. ROPER. So, sir, I will come back, I will take that for the record. But I did my first review with them a few weeks ago. And so I am expecting them to come back with a recommended acquisition plan within the next few months. But I will get you a specific date.

[The information referred to can be found in the Appendix on page 53.]

Mr. GARAMENDI. And the approximate cost of re-engining?

Dr. ROPER. So, sir, in the fiscal year 2019 budget I believe we have \$1.56 billion laid in to begin this program. That is to get it started. I believe, over the whole life of the program, it is in the \$7 or \$8 billion ballpark.

[The information referred to can be found in the Appendix on page 53.]

Mr. GARAMENDI. Thank you.

Mr. WITTMAN. Thank you, Mr. Garamendi. Gentlemen, I would like to explore a couple of other areas.

First is the FAA's NextGen air traffic management systems and the requirements that it places upon the Air Force. The concern that comes up in my mind is that it is a locational device, so that air traffic controllers can determine the place of the aircraft, aside from what they get as far as a radar signal. So it divulges our location.

So if we are looking at tactical aircraft, whether they are fighter aircraft or even strategic aircraft like bombers, and having to divulge that location, to me, that creates a situation that is, I think, a potential problem for the Air Force.

So let me ask. Is it the Air Force's intention to comply with the NextGen requirements by 2020? And if so, how do you mitigate for what I believe is an increased vulnerability that is placed on you by now-locational information that is now transmitted from the aircraft out?

General NOWLAND. Sir, that is a question right up the A3's [Air Staff, Operations, Plans and Requirements] alley, so I would love to——

Mr. WITTMAN. Yes.

General NOWLAND. I have my vice, my Senior Executive Service, is Mr. Wayne Schatz. And he is meeting with the FAA continually about that. And he sits with the FAA on two different boards to talk about this issue. We, like you, have similar concerns. So the answer is we are working a memorandum of agreement.

By the way, thank you for the question and pointing out the GAO [Government Accountability Office] report, because I had not seen it. So the report said it would be due in February. It is already March. So I have queried. We are close to getting that, which will work an accommodation between us and the FAA for our tactical airplanes.

Our large airplanes, where we can comply, we will absolutely comply to the max [maximum] extent practical. But we share the same concerns that you have.

Think about an Operation Noble Eagle mission where you have F-16s that are capping over a city to help protect the President or protect somebody. If somebody could just go on a—and find out where they were, if you know where they are then you know how to avoid them, right? So we share your concerns, and we are working with the FAA from a national defense and security strategy—North American Air Command is also involved about this, Department of Homeland Security, so we are all working together towards that accommodation.

The other part that we think is super important is there is cyber vulnerabilities, and we are working with the FAA to talk about how we mitigate those and how we ensure that we put a cyber—what I would like to call a defensive counter-air bubble of protection around our system, so that we don't introduce vulnerabilities into our systems.

Mr. WITTMAN. I would agree. I think there is—well, I think it is both a tactical and strategic question the Air Force has to deal with. I understand the air safety elements of that, but there is a national defense dimension to our fighter aircraft that we have to keep in mind.

It seems like to me the FAA would be willing to provide some type of exception or exemption for those aircraft to make sure that you can maintain that tactical superiority. And, you know, why would you want to provide somebody with a very simple device to pick up a signal that is fairly easy to pick up, that is going to be picked up by an air traffic control center, to give away aircraft location? I couldn't agree with you more.

To me—listen, I understand the air safety element of it. But I also understand too there is a much larger mission objective for those fighter aircraft. And hopefully the FAA will be mindful of your greater mission.

And listen, I understand their mission of air safety, but your mission is national security, which, to me, provides, hopefully then, food for thought on what they can do to work with you.

General NOWLAND. Mr. Chairman, I think we have a great relationship with the FAA and the whole interagency—I think this is a really good-news story for our government, because we are working together, and they do recognize we have symbiotic needs here, to be perfectly honest.

Because what we have also discovered, your air data system broadcast is subject to GPS [Global Positioning System], and GPS can be jammed. So you can create problems within that system that they are recognizing also.

And then, finally, the system is based upon everybody who wants to be part of the system. There is a recognition that you have non-cooperative people out there who want to do something for a myriad of different reasons. And from national defense, from homeland security, from just law enforcement, we need that capability. So we are working together as a team to come up with a solution set which meets the timelines.

Mr. WITTMAN. That is great. I think that is important for everybody to understand, you know, how to prioritize those elements of what your mission is and the FAA's mission. So I appreciate that.

I wanted to ask a question about—go back to airlift capacity. As I talked about earlier, we understand from TRANSCOM the demand signal that they see, not only now, but in the future, the demand from the combatant commanders. We know the C-17 line is done, so we are not going to build any more of those aircraft unless we retool and ramp back up, which is not likely.

But we do have 25 C-5s, as I said, in the boneyard. Would it make sense to bring those aircraft back? To me, having those 25 aircraft back into operation provides a tremendous amount of lift capability in our air platforms. And, of course, we are talking about the sealift side, too. But specifically to you all we are looking at the full suite of lift. And it seems like those C-5s, those 25 sitting in the boneyard, is maybe an opportunity. So—

General HARRIS. So, Chairman, that is a great question. And continuing on that line of thought, on our past studies, when we looked at this based—before we had our National Defense Strategy that aligned to us—to a new effort and structure, we did not need those. We were comfortable with holding those where they were at so that we need—if we needed them, we would have access to them.

As the ongoing mobility capabilities and requirements study completes, we will use that to inform, with the National Defense Strategy and the plans that we have sat in front of us with, the strategic alignment of our high-end capacity against our peer adversaries first. If that drives us to say we need to have additional airlift, that is one of those places we can go. Or do we need to then work with our team and actually open up a new strategic lift line? That will be part of that study.

Mr. WITTMAN. I think it is critical. As you look at the needs identified in our OPLANs [operation plans], and in talking with General Dunford about executing those OPLANs, wherever they may be, but especially in areas that are a distance, to be able to sustain those operations, the key is lift. And as you know, the—you know, the first 2 to 3 weeks, you know, we surge a lot there. We can do that. But the key is sustaining those operations.

And the limiting factor that elongates the timeframe for us to fully execute those OPLANs, the single logistical roadblock to that, is lift, being able to get supplies and folks to the fight. And especially at distance, that becomes a bigger and bigger issue.

So I think, you know, as we look at the NDS—and I do agree that we are in the age of great power competition—you know, having that capability is going to be key. So I appreciate you all looking at that and really seriously studying, you know, what we can do with those particular aircraft.

Mr. Garamendi.

Mr. GARAMENDI. Very useful line of questioning. Those 25 C-5s that are in the boneyard, what does it take and how long does it take to bring them back up?

General HARRIS. That is a great question. It is different for each aircraft. And we have different types of storage. So type 1000 is our most restrictive storage, fastest to return to fly. And aircraft in there, we can generally turn them in a couple of months. But it is one or two at a time. Our team that does that is not sufficient in

size to have that effort, based on what we are doing in day-to-day operations, their caretaker status.

If we run into an attrition event, we would be able to put more manpower after that to turn those quicker. But some of these larger airplanes, depending on if they are in type 2000 or type—different types of storage, whether we have been able to pull parts off them or not, they take up to 3 years to get them out of that storage and build, which is why the study is looking at that to say is it better to pull them out, based on the storage level that they are at, or is it better to go after new equipment.

And we also haven't talked about our Civil Reserve Air Fleet [CRAF]. That is another option for us, that if we have a peer type of a competition, there is probably not a whole lot of civil aviation going on at the time in that area. And that may free up big portions of our fleet to activate them.

Mr. WITTMAN. General Harris, another thing to consider, too, you know, we all look at CRAF as that flex, or that surge capability. But, as I said, the thing that concerns me in looking at that—and, listen, those carriers are key, I think they can perform a lot of duties, but there is a particular mission set that strategic lift aircraft can perform that those commercial carriers cannot. And that is operating that contested airspace and being able to do that and having systems on board to sense, to at least counter what may be a threat to that particular aircraft.

So I would think, within that realm, too—and hopefully the study will reflect upon that and understand, you know, if we are going to be executing an OPLAN in a contested area of the world, especially against one of our adversaries today that is—may be one that wants to be near peer, that acts badly, you know, we are going to be in a pretty challenging situation.

So I hope that you all reflect upon that. And like I said, aircraft carriers do a great job, and there is a role for them, but also for our strategic lift and—there is a time element in that, too.

So, anyway, we look forward to working with you. And just as Ranking Member Courtney said, if there are things that we can do in this year's NDAA as far as authorization, as far as direction that you feel that you need with this, please let us know, because we think this is one of those critical tipping point times where we are now devoting the resources to recapitalizing our Air Force, our Navy, our Marine Corps, and our Army. Getting this right is the key.

And I want to emphasize again that it is an extraordinarily competitive environment to compete for resources up here to put into the defense budget. So by every measure we have to make sure that these programs, which are complex programs—KC-46A, B-21, F-35—these have to be delivered on budget and on time. Because if we hiccup with these things, folks up here are going to say, "See, I told you," you know, "we put money there, they couldn't properly put it in place, they couldn't manage the dollars."

And then we are back in this scenario where the Congress' response is what? To either reduce funding—so, say, build fewer, and we all know what happens when you build fewer. What happens to unit costs? They go up. We saw that with F-22. Or what happens, too, is we say, well, we have a limited number of resources,

so build them slower. What happens to the economies of scale when you build them slower? Unit costs go up.

So we have got a delta that we have to meet. And I know that you all are focused to do this. So delta we have to meet on capacity, as well as capability. The capability is within the aircraft, the capacity is the number that we build. The only way that we get there is to make sure that these programs are successful on budget, on time. And if there are things that we need to do to enable, or things that we need to do to make sure that we are helping, let us know.

Another thing that we are responsible for is making sure that we are watching the watchers, so that is to make sure that we are laser-focused on things that are happening with this program, both within the Air Force—and I want to give you all credit. The management part of that has gone, I think, very well on some pretty complex systems. But also making sure we place the attention on the primes and the subs in all these programs, because everybody has to perform.

And I will go back to this. There are three elements of a successful program. Getting the requirements right and making sure the requirements are stable. I think, with all of these platforms they are. And stability and certainty in funding, that is our job. No more CRs [continuing resolutions], let us get the job done here so you will have certainty. And then industry has to execute. Any weakness in those three create the hiccups in programs, and then we don't have what we need.

So this is a team effort, and we look forward to working with you. And thank you for taking the time to come in today.

Mr. Garamendi, any other questions?

Very good. Gentlemen, thanks again. We are adjourned.

[Whereupon, at 3:55 p.m., the subcommittee was adjourned.]

A P P E N D I X

MARCH 14, 2018

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 14, 2018

**Opening Remarks of the Honorable Rob Wittman,
Chairman of the Seapower and Projection Forces Subcommittee,
for the hearing on
Department of the Air Force Fiscal Year 2019 Budget Request for Seapower
and Projection Forces
March 14, 2018**

Today the subcommittee convenes to receive testimony on the fiscal year 2019 Air Force budget request regarding bomber, tanker, and airlift acquisition programs.

The distinguished panel of Air Force leaders testifying before us are:

- The Honorable Mr. William Roper, Assistant Secretary of the Air Force for Acquisition;
- Lieutenant General Jerry D. Harris, USAF Deputy Chief of Staff for Strategic Plans and Programs; and
- Lieutenant General Mark C. Nowland, USAF Deputy Chief of Staff for Operations, Plans and Requirements

Gentlemen, thank you for being with us today.

The fiscal year 2019 budget request for projection forces continues to modernize and recapitalize critical Air Force weapon systems. I am pleased to see increasing investment in the B-21 Raider bomber and the high-visibility VC-25B Presidential Aircraft Recapitalization effort. Also, this budget proposes funding to continue modernizing the legacy Guard and Reserve C-130H tactical airlift fleet.

Throughout the past year in testimony to Congress, Air Force senior leadership indicated that “the Air Force is one of the busiest, smallest, oldest and least ready fleets in our history.” It is my firm conviction, in light of the threats posed by China, Russia, Iran, and North Korea, that we must provide the Air Force the resources it needs to fully support critical recapitalization programs.

With regard to bombers, the Air Force outlined its plans for its bomber fleet in the FY19 budget submission. Under this plan, the B-52, oldest bomber in the fleet, will remain on duty for the next few decades while the newest B-2 and B-1 bombers will be retired. I am interested to hear from our witnesses today about factors used to make these determinations.

As for the B-21 bomber, I fully support this critical program and am pleased to see that we are moving forward. The B-21 will be needed for projecting power over long distances and into denied environments in the future of warfare. Timely delivery of B-21 is necessary to ensure our national security. While I believe that Northrup Grumman is doing a good job at managing the risk across the entire portfolio, I look forward to assessing in better detail the B-21 program to ensure sufficient progress on design and construction.

With regard to tankers, I am concerned that continued forecast delays for KC-46A deliveries, coupled with the Air Force's plan to begin retiring 47 KC-10A aircraft across the FYDP beginning in FY19, may add unacceptable risk to Combatant Commanders' ability to execute war plans. In General McDew's testimony to my subcommittee last week, he indicated "we already know the convergence of an aging air refueling fleet with protracted KC-46 production puts the Joint Force's ability to effectively execute war plans at risk." He went on to say that "it is clear, the tanker fleet's end strength will require careful synchronization between KC-10 and KC-135 retirements and KC-46 production and delivery to sustain current force projection capabilities."

I look forward to hearing your thoughts on this program and how the Air Force intends to manage the transition of KC-10A and KC-135 aircraft with the KC-46A. Furthermore, I also look forward to hearing why Air Force believes robust investment into KC-46A is warranted considering continued delays in this program.

I am encouraged with the Air Force's sustained effort to ensure that its mobility aircraft will comply with the FAA mandated NEXT GEN air traffic management standards by January 1, 2020—with the exception of a few aircraft that will be undergoing depot modification. But I am becoming increasingly concerned about other military equities that may be impacted as we move to support the FAA mandate. While I support the migration of our tankers and airlift assets to NEXT GEN, I do worry about the lack of security protections associated with the bomber and fighter force structures. We need to carefully monitor this transition.

While I believe that the Air Force's fiscal year 2019 budget request continues to make up lost ground, I remain concerned about the Air Force's ability to fulfill Commandant Commander requirements given the shortfalls in strategic airlift, aerial refueling, and the increased risk posed by the complexities of managing the tanker and bomber transitions.

In the words of the immortal air power theorist General Giulio Douhet, "In order to assure an adequate national defense, it is necessary — and sufficient — to be in a position in case of war to conquer the command of the air." Like Douhet, it is my firm conviction that we need a strong Air Force equipped with the most capable aircraft that enable our highly skilled and motivated Airman to defend our great nation.

Once again I want to thank our witnesses for participating in our hearing this afternoon and I look forward to discussing these important topics. With that, I turn to my good friend and colleague, the ranking member of the subcommittee, Joe Courtney.

**Ranking Member Joe Courtney Opening Remarks for
Seapower and Projection Forces Subcommittee Hearing on
Department of the Air Force Fiscal Year 2019 Budget Request for Seapower
and Projection Forces
March 14, 2018**

Thank you Mr. Chairman, and thank you to our witnesses for being here. Today's hearing is an opportunity to discuss the bomber, tanker, and airlift platforms that ensure that we can respond anywhere, at any time, around the world.

The 2019 budget request for these programs reflects the challenging balancing act facing the Air Force and the Congress. For instance, the budget continues significant investment in major replacement programs like the B-21 bomber and the KC-46 tanker. At the same time, a large portion of the request also covers a range of modernization efforts aimed at keeping older legacy bombers and tankers operational and relevant for years to come.

This is not an easy balance to maintain, and your input today will help our subcommittee evaluate whether we have the right in this year's defense bill. With that in mind, I wanted to quickly highlight a few areas of focus.

As I noted earlier, the 2019 budget continues significant and needed investment in the KC-46 tanker replacement. However, I remain concerned about additional delays in this high-priority program. Just last week, the Air Force announced that the delivery of the first operational tankers may not occur until next year. I hope our witnesses today will explain how the Air Force is working to address the program's schedule and the impact of delays on the rest of the tanker fleet.

Another ongoing area of ongoing and bipartisan interest on our subcommittee is the modernization of our C-130H fleet. This subcommittee has led the way in moving upgrades like the Avionics Modernization Program, or AMP, forward after years of delay and I appreciate the Air Force's continued support for AMP in the 2019 budget. However, I am disappointed that budget does not fund other needed upgrades like new high-efficiency propellers and engines for this fleet. I look forward to exploring this issue more in our session today.

I also hope that our witnesses will provide additional clarity into recent developments on the Air Force One replacement program. There have been very public and high level pronouncements about a deal to save \$1 billion on the new aircraft. Unfortunately, to date very little detail has been provided to our subcommittee, or the American public, about this arrangement. At the same time, the Air Force is moving forward on costly sole source contracts to sustain and upgrade the current Presidential aircraft. I believe that our subcommittee deserves greater insight into what is happening with this program as well begin our work on this year's defense bill.

Finally, I wanted to take a moment to highlight the “Flying Yankees” of Connecticut’s 103rd Airlift Wing. In 2017, the wing demonstrated the versatility and relevance of the C-130H mission by deploying both overseas to support ongoing missions abroad and domestically in support of hurricane relief. Whether it was flying over 1,300 combat sorties or delivering over 200 tons of food, water and supplies to hurricane victims, the men and women of the 103rd showed just out valuable they, and their aircraft, are to our nation.

Thank you again to our witnesses. I look forward to today’s discussion.

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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES
U.S. HOUSE OF REPRESENTATIVES

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE
HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES
U.S. HOUSE OF REPRESENTATIVES

SUBJECT: AIR FORCE BOMBER/TANKER/AIRLIFT ACQUISITION PROGRAMS

STATEMENT OF: The Honorable William B. Roper, Jr.
Assistant Secretary of the Air Force
(Acquisition, Technology & Logistics)

Lt Gen Jerry D. Harris, USAF
Deputy Chief of Staff
(Strategic Plans and Programs)

Lt Gen Mark C. Nowland, USAF
Deputy Chief of Staff (Operations)

March 14, 2018

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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES
U.S. HOUSE OF REPRESENTATIVES

Introduction

Chairman Wittman, Ranking Member Courtney, distinguished members of the subcommittee, thank you for the opportunity to provide you with an update on U.S. Air Force acquisition programs. Additionally, thank you for your leadership to bring fiscal stability back to our government departments and agencies. Stable, predictable funding levels are critical to arrest the readiness decline in the Air Force's Global Mobility and Bomber forces as we look forward to our future national security interests.

The new National Defense strategy is clear: inter-state strategic competition, not terrorism, is now the primary concern in U.S. national security. The Air Force is committed to regaining readiness soonest. We are examining a myriad of initiatives to mitigate the toll 27 years of global operations has taken on our Airmen, equipment, and infrastructure. Meanwhile, our adversaries leveraged this opportunity to advance their own capabilities and close the technological gap. We must modernize in the core missions of global strike and rapid global mobility in order to maintain our asymmetric military advantage.

Last year, our bombers flew 580 missions in the Indo-Pacific, strengthening security and stability in the region and reassuring our partners. Reinforcing NATO's eastern flank, American bombers flew 70 assurance and deterrence missions. Together, our nuclear and conventional bombers, in concert with our tanker aircraft, provide global power and global reach to ensure an effective deterrence. But both of these important fleets are aging. The average ages of the B-52 strategic bomber and the KC-135 tanker both exceed 50 years, and we will continue to use them for decades. The B-1 and B-2 bombers must continue to be modernized to ensure they remain viable and capable until we transition to the B-21. Our budget proposal supports the Defense

Department's principal priority to maintain a safe, secure, and effective nuclear deterrent that safeguards the homeland, assures allies, and deters adversaries. The budget improves our nuclear command, control, and communication systems, as directed in the Nuclear Posture Review, initiates development of B-52 replacement engines, and continues development of the B-21 bomber.

Rapid Global Mobility not only enables the bomber force to hold any target around the world at risk at any time, but also supplies the largest military logistic network in history. In 2017, Airmen transported nearly 1 million personnel and delivered over 738 million pounds of warfighting equipment and humanitarian supplies. At home, Airmen delivered 13,600 short tons of relief supplies following the string of record-setting hurricanes and helped combat multiple wild fires in the western United States. The tanker force extended joint power projection at intercontinental distances by passing more than 1 billion pounds of fuel in-flight. Tanker recapitalization remains a top acquisition priority. The multi-role KC-46 will be capable of refueling joint and coalition aircraft—with both boom and drogue in the same sortie—and augments the airlift fleet with improved cargo, passenger, and aeromedical evacuation capabilities. This budget proposes to buy 15 more KC-46 tankers in FY19 to recapitalize our aging fleet and extend the fight to our enemies.

The Air Force must build a more lethal and ready force, strengthen alliances and partnerships, and cost-effectively modernize to *compete, deter, and win* in any environment. Modernization is a multi-year effort, and the Air Force needs your continued support in the form of stable, predictable, and timely funding levels to prevent our adversaries from closing the technology gap. We remain committed to providing the most effective bomber and robust tanker forces possible to the nation.

Bombers

Over the past two decades our total bomber inventory has been significantly reduced. To provide perspective, in 1991 we had 290 aircraft available within the bomber fleet versus 158 B-1, B-52s, and B-2s today. Current operations, training, and readiness needs—and our deterrent posture—will be difficult to sustain with the current fleet.

B-21

The B-21 program remains one of the Air Force's top programs with regards to investment in research, development, test and evaluation with \$2.7 billion for Engineering and Manufacturing Development in the Fiscal Year 2019 President's Budget. The B-21 continues to make measured, positive progress and remains on track to deliver its initial capability in the mid- 2020s.

The program successfully completed a Preliminary Design Review in 2017 demonstrating that the Air Force, along with its industry partners, are continuing to develop the design maturity of this platform. The development phase of the program is well on the path to detailed design.

The Air Force remains committed to a fleet size of a minimum of 100 B-21s. This fleet will provide capabilities necessary to meet future Combatant Commander requirements. The B-21 remains an absolute national defense priority, and we are grateful for your continued support of this critical program. Until the B-21 is fielded, it is equally important that we continue the commitment to modernize our legacy bomber fleet to maintain the ability of our Air Force to provide Nuclear Deterrence Operations, Nuclear Response, Global Strike, and Global Precision Attack.

B-1

The B-1B is a long-range, air-refuelable multirole bomber capable of flying intercontinental missions with the largest payload of guided and unguided weapons in the Air Force inventory. The Integrated Battle Station upgrade, \$100 million across the FYDP, will provide enhanced situational awareness and precision engagement capabilities and is the B-1B's largest modernization effort since its production. The first aircraft with this upgrade was delivered in January 2014, and a total of 37 B-1s are currently modified with this capability. The B-1B will complete this modernization effort in 2020.

Other efforts to update the B-1B's navigation and radar systems were completed in early 2016. These efforts improve reliability and maintainability of these critical systems. Additionally, the Air Force has fully funded the Service Life Extension Program (SLEP) for B-1 engines. This funding will replace parts that have been degraded by nearly 15 years of combat and restore all 289 B-1 engines to their original specifications. Finally, ongoing testing is validating the B-1B's structural integrity to ensure that it remains viable through 2040.

The B-1B is the Air Force threshold platform for early operational capability of the Long Range Anti-Ship Missile, which is transitioning from a Defense Advanced Research Projects Agency (DARPA) demonstration to the Navy-led Offensive Anti-Surface Warfare Program. Integration of this weapon, coupled with the B-1B's long range, high speed and large payload capacity, will posture the B-1B for an important role in any conflict in the Indo-Pacific region.

B-2

The B-2 is the only long-range strike aircraft capable of penetrating and surviving advanced Integrated Air Defense Systems to deliver weapons against heavily defended targets.

Its unique attributes of intercontinental range, precision strike, large conventional or nuclear payloads, ability to penetrate defenses, and low observable profile allow it to execute Nuclear Deterrence Operations, Nuclear Response, Global Strike, and Global Precision Attack missions. The Air Force will continue to modernize the B-2 to ensure it remains effective as enemy defensive systems advance. Current efforts to modernize the Defensive Management System, \$1.3 billion within the FYDP, will ensure the B-2 can continue to counter sophisticated air defense networks and operate in highly contested environments.

The Air Force will continue development efforts to re-host the Stores Management Operational Flight Program software in the Flexible Strike program, enabling the B-2 to take advantage of advanced digital weapon interfaces such as those used by the B61-12 nuclear weapon. The Air Force has completed development efforts and started procuring hardware for the Common Very-Low-Frequency / Low Frequency (VLF/LF) Receiver program and will begin fielding the system in FY2019. This program provides the B-2 with a VLF/LF receiver for secure, survivable strategic communications capability. Except for delivering spares hardware, the Air Force has completed fielding the Extremely High Frequency Satellite Communications and Computer Increment 1 program: a mid-life avionics upgrade to the flight management computers and digital storage and data buses. Other on-going B-2 programs address a two-part modernization effort. The first part entails needed avionics upgrades to meet global and Federal Aviation Administration (FAA)-mandated air traffic management standards, (i.e., Mode and Automatic Dependent Surveillance–Broadcast Airspace Compliance). The second piece of the modernization effort supports operational capabilities by enhancing the Identification Friend or Foe (IFF) system, Crash Survivable Memory Unit replacement, and hardware upgrades for the employment of the GBU-57 Massive Ordnance Penetrator as well as the B61-12 nuclear weapon.

A new effort beginning in Fiscal Year 2019 is the Radar Aided Targeting System software upgrade to enhance the accuracy of navigation data passed to the B61-12 nuclear weapon (\$42.7 million total). Finally, the Air Force will continue to pursue a number of B-2 sustainment initiatives to improve aircraft supportability and increase aircraft availability.

B-52

The last B-52H Stratofortress entered service in the United States Air Force in 1962, and it remains our nation's oldest and most versatile frontline long-range strategic bomber. We expect to continue operating the B-52 through 2050 and will continue to invest in modernization programs to keep the platform operationally relevant with state-of-the-art updated capabilities. Major modernization efforts include the Radar Modernization Program (RMP), (\$766 million across the FYDP), Combat Network Communications Technology (CONNECT), (\$163 million through the FYDP), and 1760 Internal Weapons Bay Upgrade programs, (\$25 million within the FYDP). RMP will modernize the current Strategic Radar (AN/APQ-166). The current radar is based on 1960s technology and was last modified in the 1980s. The radar upgrade will support platform viability through 2050. The FY19 PB also includes \$1.56 billion for re-engining the B-52 with currently-available commercial engines: a great example of the Air Force looking to commercial technology to address sustainment challenges with the legacy TF33 engines before they become unsustainable in 2030.

CONNECT provides an integrated communication and mission management system as well as a machine-to-machine interface for weapons retargeting for the entire fleet of 76 B-52Hs. The digital infrastructure and architecture provided by CONNECT is the backbone for the 1760 Internal Weapons Bay Upgrade (IWBU) and future modification efforts. The 1760 IWBU provides internal J-series weapons capability through modification of Common Strategic Rotary

Launchers (CSRLs). Both increments of this program are fully funded and will significantly increase the B-52's capability to store and deliver the Joint Direct Attack Munition (JDAM), Laser-JDAM, Joint Air-to-Surface Standoff Missile (JASSM) and its extended range variant, and the Miniature Air Launched Decoy (MALD) along with its jamming variant. The Air Force is committed to modernization of the B-52 using modern technology to ensure the aircraft remains relevant through 2050+ as an important element of our nation's defense.

C-17

The C-17 is the only aircraft that combines tactical capability with strategic range to operate from austere airfields. The fleet of 222 aircraft completed fielding in September 2013 and provides our nation unmatched flexibility to conduct theater and inter-theater direct delivery, airdrop, aeromedical, and special operations airlift missions. In order to increase predictability of budget and schedule, our plan is to bundle modernization and sustainment activities. Agile and efficient software and hardware updates will ensure timely readiness, safety, and capability improvements, as this premier airlift platform contributes to our national security objectives.

The Air Force intends to use \$125.1 million in FY19 procurement funds to continue critical sustainment, modifications, and upgrades to the C-17 fleet. This includes Automatic Dependent Surveillance-Broadcast (ADS-B) Out to satisfy FAA and civil airspace compliance mandates as well as IFF for the identification and control of military aircraft: essential for Command and Control. Additionally, \$49.3 million of FY19 RDT&E funding will address obsolescence and flight safety issues. The development of a replacement heads-up display will address obsolescence of the current C-17 heads-up display and improve the system's availability, reliability, and maintainability. The beyond line-of-sight communication system effort modernizes multi-channel voice and data communication subsystems to ensure the C-17 keeps

pace with changes in DoD communication infrastructures.

C-5

The Air Force continues to modernize and enhance 52 legacy C-5 aircraft to a common configuration to ensure fleet viability and reliability to 2040. The C-5 reliability enhancement and re-engining program is a comprehensive effort to improve aircraft performance, reliability, maintainability, availability, and payload capability/cargo throughput. All 52 aircraft have been inducted as of January 2017, and the final aircraft is projected to complete modification in April 2018.

The increased reliability and performance of the C-5 Super Galaxy exemplifies our Global Reach. During the first week of March 2017, an upgraded C-5 Super Galaxy flew a cargo mission from Travis Air Force Base, California to Yokota Air Base, Japan without stopping or refueling, skipping a layover at Joint Base Pearl Harbor-Hickam, Hawaii, or Joint Base Elmendorf-Richardson, Alaska. This range and payload capability saves time, fuel, and money.

The FY19 PB requests \$80.6 million in procurement funds, predominately for C-5 core mission computer/weather radar system equipment. Additionally, the FY19 PB requests \$25.1 million in RDT&E funding to support communications, navigation, surveillance/air traffic management upgrades, including ADS-B Out modifications required for global airspace compliance. The C-5 core mission computer/weather radar system replaces an antiquated radar system with diminishing manufacturing sources and upgrades the core mission computer processor to meet the demands of future software modifications. Finally, the FY19 PB continues the buy back of C-5Ms from Backup Aircraft Inventory (BAI) to Primary Aircraft Inventory

(PAI) as determined during FY18 PB development. The Air Force buys back 2 C-5Ms from BAI to PAI in FY19.

Tankers

Comprised of 396 KC-135 Stratotankers and 59 KC-10 Extenders, our tanker fleet provides the backbone of rapid U.S. global operations. Delivery of 179 KC-46 Pegasus aircraft by 2028 will replace less than half of the current tanker fleet and leave the Air Force with 300 aging KC-135s awaiting recapitalization. Tankers are the lifeblood of our joint force's ability to respond to crises and contingencies quickly and are essential to keeping our Air Force fueled as a global force.

KC-135 and KC-10

The average KC-135 is 55 years old. Both the KC-135R and KC-10 fleets are frequently challenged by aircraft parts obsolescence and diminishing manufacturing source issues. However, with the help of both organic Air Force depots and industry, we are able to maintain these platforms as effective and safe weapon systems for the warfighter. We are executing several key modernization, safety and compliance initiatives to ensure our legacy tanker fleet remains viable through 2057.

The FY19 PB requests \$69.4 million to continue KC-135 modernization efforts. The primary modernization effort for KC-135 is the Block 45 program, which addresses supportability, reliability, and maintainability issues with legacy flight and engine instruments by integrating a digital flight director, autopilot, radio altimeter, and electronic engine instrument display for our operators.

Furthermore, the FY19 PB also requests \$60 million through the FYDP to continue

upgrading and sustaining our KC-10 fleet through its planned sunset, which includes funding for service bulletins, low cost modifications, and IFF Mode 5 and ADS-B Out upgrades. Mode 5 is a development effort to complete a DoD-mandated upgrade to the IFF systems on aircraft planned for implementation in FY20. The FY19 PB also funds ADS-B Out avionics modifications on 45 KC-10 aircraft to comply with the FAA airspace mandate. The Air Force intends to recapitalize the KC-10 fleet as part of its legacy tanker recapitalization strategy with KC-10 retirements beginning no earlier than FY19 depending on KC-46A delivery schedules.

KC-46

While we continue to sustain our current tanker capability, building our future tanker fleet remains one of our top acquisition priorities. After a successful Milestone C decision in August 2016, the Air Force exercised contract options for aircraft Lots 1 and 2: 19 aircraft, 4 spare engines, and 10 wing aerial refueling pod shipsets. The Air Force awarded Lot 3 (15 aircraft) on January 27, 2017 under the authorization of an anomaly in the FY17 Continuing Resolution and plans to award Lot 4 (15 aircraft and associated spares and support equipment) in third quarter of FY18.

We are conducting a schedule risk assessment in partnership with Boeing. The Air Force continues to support Boeing's efforts towards delivery. Boeing is a valued partner and remains fully committed to the program. The Air Force will continue to work closely with Congress and continue to provide updates as appropriate on program status.

In the FY19 PB, the Air Force requests \$88.2 million in RDT&E funding for the ongoing KC-46 engineering and manufacturing development and post production modification efforts. The FY19 PB also requests \$2.9 billion in procurement funding to award low rate initial

production Lot 5 (15 aircraft) in January 2019. The procurement of these aircraft continues the Air Force's plan to acquire 179 KC-46s by FY28. Stability of requirements and funding are the keys to KC-46 program success and will enable the Air Force to deliver this new tanker ready for employment on day one.

C-130

The C-130 fleet is diverse and consists of legacy C-130H and C-130J aircraft, as well as special mission aircraft (AC/LC/EC/MC/HC/WC-130s). The C-130Hs and C-130Js are medium-size transport aircraft capable of completing a variety of tactical airlift operations across a broad range of missions. The fleet delivers air logistics support for all theater forces, including those involved in combat operations.

The Air Force is modernizing the C-130H fleet through a four-pronged approach emphasizing aircraft safety, compliance, modernization, and partial recapitalization. Firstly, we are ensuring the C-130H is safe to operate by keeping the aircraft structurally sound through programs such as center wing box replacement. This program is a critical safety effort as it will replace center wing boxes whose service life will soon expire. Secondly, we are focused on meeting U.S. and foreign airspace compliance mandates through the C-130H avionics modernization program (AMP) increment 1. Thirdly, C-130H avionics modernization program increment 2 will improve the fleet's maintainability and reliability by providing a new digital avionics suite that mitigates pending obsolescence and diminishing manufacturing source issues.

The FY19 PB requests \$106.0 million in RDT&E and \$22.7 million in Aircraft Procurement, Air Force (APAF) to support the legacy C-130H fleet. The Air Force intends to

partially recapitalize or modernize each of the Air National Guard and the Air Force Reserve Command C-130H units. The Air Force also intends to continue recapitalizing Air Force Special Operations Command's special operations C-130Hs with C-130Js (AC/MC-130Js).

The C-130J aircraft provides extra cargo carrying capability, longer range, and better fuel efficiency for our combat delivery mission when compared to legacy C-130s. Special mission variants of the C-130J conduct airborne psychological operations and offensive electronic warfare (EC-130J), weather reconnaissance (WC-130J), search and rescue (HC-130J), and special operations (MC-130J and AC-130J). Current modification efforts include center wing box replacement, large aircraft infrared countermeasures, and avionics upgrades to become compliant with ADS-B Out capabilities in order to meet emerging global airspace requirements as part of the C-130J Block 8.1 upgrade. The FY14 National Defense Authorization Act authorized multi-year procurement for the C-130J. As part of the multi-year contract, the Air Force is procuring 72 C-130Js (all variants) through FY18. The FY19 PB requests \$15 million for C-130J RDT&E and \$177 million for C-130J modification efforts. The FY19 PB also requests \$33 million for HC/MC-130J RDT&E and \$1,344 million for HC/MC-130J procurement and modification efforts.

VC-25B

The VC-25B program, formerly known as the Presidential Aircraft Recapitalization program, will replace VC-25A in 2024 via a highly-tailored acquisition program. The Air Force Presidential VC-25A fleet faces capability gaps, rising maintenance costs, and parts obsolescence as it reaches the end of its planned 30-year life cycle. The Air Force will deliver a new fleet of aircraft to enable the President of the United States to execute the duties of Head of State, Chief Executive, and Commander in Chief. The Boeing 747-8 commercial aircraft will be uniquely

modified to provide the President of the United States, staff, and guests with safe and reliable air transportation with the equivalent level of communications capability and security available in the White House. Modifications to the aircraft will include electrical power upgrades, a mission communication system, a medical facility, executive interior, a self-defense system, and autonomous ground operations capabilities. The FY19 PB requests \$673 million to complete the preliminary design and begin engineering and manufacturing development for two Boeing 747-8 commercial aircraft.

Conclusion

The USAF remains committed to providing the most effective bomber and robust tanker forces possible to the nation. In the midst of the challenges ahead, we will aim to keep these programs on track and deliver these systems-not only as a vital capability to our forces-but also as a best value to our taxpayer. These systems will provide the future capabilities necessary to operate effectively in the warfighting environment of tomorrow.

William B. Roper Jr.

Education:

Georgia Tech

Dates: 09/1998-08/2001

Degree: Bachelor of Science (Physics), Minor (Mathematics)

Georgia Tech

Dates: 09/2002-08/2002

Degree: Master of Science (Physics)

Oxford University

Dates: 10/2002-04/2010

Degree: Doctor of Philosophy (Mathematics)

Employment Record:

Office of the Secretary of Defense

Position: Director, Strategic Capabilities Office

Locations: Pentagon; Arlington, VA

Dates: 08/2012-present

Office of the Under Secretary of Defense for Acquisition, Technology, & Logistics

Position: Member, Missile Defense Advisory Committee

Locations: Pentagon, Missile Defense Agency (MDA) Headquarters

Dates: 08/2010-08/2011

MIT Lincoln Laboratory

Position 1: Ballistic Missile Defense System Architect (Acting)

Location: MDA Headquarters

Dates: 06/2010-08/08/2012

Position 2: Technical Staff Member (Systems and Architectures Group)

Locations: Bedford, MA; MDA Headquarters

Dates: 01/2006-06/2010

Honors and Awards:

Department of Defense Medal for Distinguished Public Service

Secretary of Defense Award for Excellence

Under Secretary of Defense for Acquisition, Technology & Logistics Award for Innovation

Missile Defense Agency Contractor of the Year

Missile Defense Agency Award for Innovation

Missile Defense Agency Award for Technology

Rhodes Scholar

Truman Scholar

Lieutenant General Jerry D. Harris Jr.
Deputy Chief of Staff Strategic Plans & Programs

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

General Harris entered the Air Force in 1985 as a graduate of the ROTC program at Washington State University. He has served as a flight commander, operations officer, weapons officer and inspector general. The general served on the staffs of two numbered Air Forces and one major command, all in operations. He has also served as the Combined Air and Space Operations Center Battle Director for operations Iraqi Freedom and Enduring Freedom. General Harris has commanded at squadron, group and wing levels. Prior to his current assignment, General Harris was the Vice Commander, Air Combat Command, Langley Air Force Base, Virginia, responsible for organizing, training, equipping and maintaining combat-ready forces for rapid deployment and employment while ensuring strategic air defense forces are ready to meet the challenges of peace time air sovereignty and wartime defense.

General Harris is a command pilot with more than 3,100 flying hours in the F-16.

Lieutenant General Mark C. Nowland

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

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

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

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

MARCH 14, 2018

RESPONSE TO QUESTION SUBMITTED BY MR. NORCROSS

Dr. ROPER. The original Engineering, Manufacturing, and Development (EMD) contract for the KC-46 was signed in February 2011. It established the requirement for the delivery of 18 aircraft required assets available (RAA) in August 2017 (78 months after contract award). This requirement drove the expectation (not contractual agreement) that the first aircraft would be delivered in calendar year 2016 in order to have the 18 aircraft RAA met by August 2017. [See page 10.]

RESPONSES TO QUESTIONS SUBMITTED BY MRS. HARTZLER

Dr. ROPER. Development of the B-2 VLF/LF capability, known as the Common Very Low Frequency/Low Frequency (VLF/LF) Receiver Increment 1 (Common Very Low Frequency Receiver Increment 1), began in fiscal year 2013 to provide secure, survivable nuclear command, control and communication (NC3) capability to the B-2. The production installation contract was signed January 16, 2017 and the first production installations completed March 14 2018. The final B-2 VLF/LF installation is planned for the third quarter of fiscal year 2020. [See page 18.]

Dr. ROPER. The software-only B-2 Radar Aided Targeting System (RATS) program is a fiscal year 2019 new start effort. The RATS program provides improved B-2 navigational handoff accuracy in a GPS-denied environment to digital nuclear weapons such as the B61-12. Final fielding of the software in the B-2 is expected by the end of fiscal year 2021. [See page 18.]

RESPONSES TO QUESTIONS SUBMITTED BY MR. GARAMENDI

Dr. ROPER. The Air Force is exploring a range of options to include extending the life of the current engines or purchasing commercial engines. We are planning for an approval of the acquisition strategy in September 2018 and it will serve as the decision point for engine type that will be pursued. [See page 20.]

Dr. ROPER. The FY19 PB has requested \$64.5M for FY19 and \$1.56B through the FYDP (FY19-23) for RDT&E and Aircraft Procurement Air Force (APAF). The cost estimate will be completed after the Acquisition Strategy is finalized. [See page 20.]

