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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2021
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED SIXTEENTH CONGRESS
SECOND SESSION
—
SUBCOMMITTEE ON SEAPOWER AND
PROJECTION FORCES HEARING
ON
**AIR FORCE PROJECTION FORCES
AVIATION PROGRAMS AND CAPABILITIES
RELATED TO THE 2021 PRESIDENT'S
BUDGET REQUEST**
—

HEARING HELD
FEBRUARY 27, 2020



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**AIR FORCE PROJECTION FORCES AVIATION
PROGRAMS AND CAPABILITIES RELATED TO THE
2021 PRESIDENT'S BUDGET REQUEST**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES,
Washington, DC, Thursday, February 27, 2020.

The subcommittee met, pursuant to call, at 3:30 p.m., in room 2118, Rayburn House Office Building, Hon. Joe Courtney (chairman of the subcommittee) presiding.

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

Mr. COURTNEY The Seapower and Projection Forces Subcommittee meets this afternoon to hear testimony on the Department of Air Force fiscal year 2021 budget request. Before us today to discuss the request are Assistant Secretary of the Air Force for Acquisitions, Dr. William Roper, and Deputy Chief of Staff for Plans and Programs, Lieutenant General David Nahom. Did I pronounce that right? Okay. Thank you. Thank you, both, for being here today.

The bombers, tankers, and airlifters under our oversight form the critical backbone of our ability to project force and support operations around the world. With increasing age and readiness challenges, the current fleet is already strained in meeting key war-fighting requirements.

The Department of Air Force's budget request for 2021 proposes force structure cuts across these critical capabilities, retiring dozens of aircraft over the next 5 years, and asks to redirect a large share of that money towards modernization and advanced capabilities.

The question for our subcommittee as we begin our work on the next NDAA [National Defense Authorization Act] is whether this budget request properly balances the investment in the future capabilities with the risk being assumed by giving up already strained capacity today. For example, the budget proposes to procure 15 new KC-46 tankers in 2021 while retiring 29 legacy tankers. At the same time, the Air Force plans to continue accepting new KC-46, even as the fix to ongoing problems with the remote visual system [RVS], a key element of refueling capabilities, is still being developed. And I am sure we are going to hear about that this afternoon.

Just last week, I had the opportunity to see the KC-46 program and the RVS system firsthand. That visit made clear to me that this is a fundamental hardware problem that must be resolved to

make this system workable. I understand efforts are underway to establish a path towards resolving these issues and I hope we will see a clear plan soon.

While that process continues, however, the budget asked this committee to authorize retirement of tankers as the aircraft meant to replace them—to authorize the retirement of tankers as the aircraft meant to replace them cannot be flown operationally. Our mobility commanders are raising serious alarm about the critical gaps this will create in our aerial refueling requirements. This subcommittee has been and will continue to scrutinize whether the Air Force's stopgap plan is the right approach.

Similarly, I am concerned that the Air Force continues to lack a plan for sustaining the tactical airlift capabilities of our Air National Guard. This committee has pursued a two-pronged approach on this important issue: first, directing congressionally directed investment and modernization efforts like upgraded avionics, safety enhancing propellers and high-performance engines; and second, pursuing congressionally directed procurement of new C-130Js [transport aircraft].

I say congressionally directed because it has been Congress, in many cases this subcommittee, who has led these efforts when the Air Force budgets have failed to do so. That appears to be the case again with a plan to replace 24 C-130H aircraft with 19 C-130Js in 2021 and no further plans to modernize or recapitalize the fleet beyond required electronics upgrades. This remains a top concern of the subcommittee and one that we hope we will address in the 2021 defense authorization.

With that, now I would like to welcome our on-time and highly qualified ranking member, Rob Wittman, for his opening remarks.

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

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

Mr. WITTMAN. Well, Joe, thank you again and thanks so much for your leadership and I appreciate you yielding the floor and I want to thank our two witnesses today for testifying before us.

As we take a look at this budget request, it appears that this budget is only the beginning of an effort to address a great powers competition and that we have a long way to go. I am supportive of many of the efforts to divest certain legacy aircraft and use that funding as a down payment on future requirements. In fact, I have been encouraging all of the services to do this. However, I do remain concerned about two specific areas in the budget request, namely bombers and tankers. As to bombers, we have been on this journey for several years. Because of the nature of future conflict, bombers will be an increasingly valuable asset over shorter range capabilities to ensure the U.S. has persistent operations in a contested environment.

Giving credit where credit is due, the B-21 Raider looks like a promising capability and is tracking toward timely delivery. However, as to our existing bomber force structure, I continue to have concerns with our B-1 Lancer low mission-capable rates, the rec-

ommendation not to modernize the B-2 Defensive Management System, and considerable uncertainty on the bomber road map. And I remain concerned about our ability to project long-range strikes. Considering the recommendation to retire certain B-1 bombers and not modernize the B-2, I look forward to careful assessment of the budget request to ensure we retain adequate strike capability.

The tanker force structure may be the most perplexing element in the budget request. With a recommendation to retire certain KC-135 and KC-10 aircraft and the continued delay in delivering capable KC-46A aircraft, I think that we need to make significant changes. I do not understand why the Air Force continues to accept deficient KC-46A tankers that are not mission capable. We may be years away from an adequate capability, and I want to give the Air Force credit for their tremendous efforts to make sure we get there. I think there has been a lot of progress that had been made, but we are still years away. Yet, the Air Force appears ready to enter into a full-rate production of a deficient KC-46A aircraft and has requested an astounding 15 KC-46A aircraft in its budget request.

If Senator John McCain were here today, I am very confident of what his response would be. Considering the multiyear effort to fix KC-46A, I think it is time to slow down ordering and delivery of deficient KC-46A aircraft and to retain adequate legacy tankers to ensure that we can provide adequate capabilities. It is not surprising that General Lyons, commander of U.S. Transportation Command, indicated last week that this budget request "creates a capacity gap with significant impacts to combatant command daily competition and wartime missions, and negatively impacts senior leader decision space for mobilization when confronted with a crisis." I agree with General Lyons and think it is time to reverse this dangerous trend.

Again, I thank Chairman Courtney for his leadership and for having this important hearing and I yield back the balance of my time.

[The prepared statement of Mr. Wittman can be found in the Appendix on page 27.]

Mr. COURTNEY. Thank you, Mr. Wittman.

And now Dr. Roper, the floor is yours.

STATEMENT OF HON. WILLIAM B. ROPER, JR., ASSISTANT SECRETARY OF THE AIR FORCE, ACQUISITION, TECHNOLOGY AND LOGISTICS, U.S. AIR FORCE; ACCOMPANIED BY LT GEN DAVID S. NAHOM, USAF, DEPUTY CHIEF OF STAFF, PLANS AND PROGRAMS, U.S. AIR FORCE

Secretary ROPER. Chairman Courtney, Ranking Member Wittman, and distinguished members of the subcommittee, I thank you, one, for holding this hearing today and for your interest in the future of the Air Force and for the support that you provide our systems and our airmen and their families.

We are very excited to talk with you about the things that are positive in our budget, the things that we are doing to modernize to get prepared for peer competition, the things that we are doing to speed up the acquisition system so we can compete long term, and our ability to keep the force that fights today ready.

We are very mindful of the time that we have for today's hearing, so with your permission I would like to have our statement read into the record, our written statement. And with that, we would like to go ahead and go to your questions, sir.

[The joint prepared statement of Secretary Roper and General Nahom can be found in the Appendix on page 29.]

Mr. COURTNEY. Great. No objections. So again, for the record, it is 4:45 is the hard stop with Dr. Roper. Okay.

So why don't we—I am going to ask just one question and we will move along here. I have a question on the KC-46. Having—again, having had a chance to visit just last week. And I know Mr. Norcross and Mrs. Hartzler also were out in California as well, and—sorry, Washington State as well.

Can you just kind of give an update in terms of just the process of what the Air Force did in terms of its sort of deeper analysis in terms of using science and medicine and just sort of how that has affected the plan moving forward?

Secretary ROPER. Mr. Chairman, it has been an interesting and really fascinating progress on KC-46 just from an intellectual standpoint, but as a scientist I have really enjoyed learning that an RVS is much more complicated than just mere cameras.

As a reminder, about 18 months ago, we were still arguing over pictures. We would have images that were washed out where you couldn't see the receptacle side by side with images where you could see the receptacle perfectly. And we didn't understand how to design an RVS, how to look at performance specifications and know it would work prior to making it. That is when we brought on scientists from the Air Force and for Boeing who are experts in human vision, who are experts in how humans interact with displays. And we really put the reins in their hands. We asked them what are the basic technical characteristics that tell you a remote visual system will work where you know that before you build it and you can measure any system up to those standards to know that it will work in the field.

When we accepted the first aircraft, we modified the contract. We shifted from the vague language of the firm-fixed-price contract which was the original one to nine critical performance specifications. Over the last year, we have been looking at trying to—well, Boeing has been looking at trying to tweak the current design. Over the last 3 weeks, I have seen the team make more progress than they did during the year that preceded it with the scientists really converging quickly on the designs that will pass. Though we have more work to do, the commitment that I have with Boeing is that science will lead the future of the program. We will be data driven. We will be science driven and as long as we stay in that technical framework, I am very confident of getting to an agreement quickly that will pass muster for the warfighter and for the taxpayer as well.

Mr. COURTNEY. And again, just real quick, so the initial analysis which again sort of just looked at like you said, the interaction between the human eye, nervous system, and the existing system that was there, I mean what was—there was obviously an impact in terms of the airmen. And maybe you can just sort of describe what that was physiologically and then I will yield to Mr. Wittman.

Secretary ROPER. Yes, sir. So, the original contract doesn't call for remote visual system. It just says deliver a tanker that can tank. The RVS was a design choice for Boeing. And I think early on, because Boeing had built past tankers with remote visual systems, they thought it would not be difficult, but it is much more complicated than meets the eye, pun intended. And some of the choices they made on previous tankers, they had happy accidents where mistakes canceled each other out and they got better performance than we currently see.

We are now at such a level of technical understanding that we understand how men and women will be affected differently, how old and younger operators will be affected differently because age of eyes affects performance, distance of pupils affects performance.

We now know terms like focus fixation mismatch and dipvergence and depth plane compression and curvature, things that were not parlance in the tanker a year and a half ago. These are the things that we measure to ensure that the tanker represents on the display the three-dimensional reality that is outside. So, the scientist would understand that far better than I do. I have gotten smart because of them. They are bringing in designs and showing us which ones are capable of meeting a level of performance that can tank every aircraft and which ones can't.

When I say we have made more progress over the last 3 weeks than the year before, I don't think I have ever seen a program make this much progress this fast. And the thing I will take as a takeaway from this is things are a lot better when you have technical people leading. You get to agreements faster and so I am excited for the future of the program as long as scientists and engineers continue to lead and we are data driven in our decisions. I wish I could say more. We are still negotiating with Boeing, but we are making progress and we are trending in the right direction and trending quickly.

Mr. COURTNEY. Thank you.

Mr. Wittman.

Mr. WITTMAN. Thank you, Mr. Chairman. Dr. Roper, I wanted to get a little bit deeper in the KC-46A. Last month, Chief of Staff General Goldfein came and testified before us and said none of the timelines for the remote visioning system were going to be met, and based on Boeing's latest proposal, the timelines to get a final fix to the warfighter is going to slip to the right by 2 years.

First of all, I wanted to get your thought on that, if you agree with General Goldfein's assessment. Second of all, with these deficiencies, is it wise to go to full-rate production on KC-46A? And should we not take some kind of pause or at least reduce to the minimal acceptable level of delivery under the contract until we get the permanent fixes to both the hardware and software?

Secretary ROPER. Ranking Member Wittman, with respect to the key testimony, I had seen the change in the last 3 weeks, so I will just say the pressure and encouragement that is coming in from senior leaders like General Goldfein, from members like yourself, and the interest that you take in going out and seeing things in the real world which is very helpful for us because when we are having discussion in a hearing like this we are discussing from a common frame of reference. All of that is helping us trend in the

right direction. So, give me a few more weeks to continue to work the details, but I am excited about the future of KC-46 for the first time.

With respect to acceptance rates, you are absolutely right. There is a certain number that Air Mobility Command needs to get operators trained, to get maintainers trained, to start standing up new bases that need to have some proficiency with the vehicles. And it is a tanker, but it is also a mobility asset and an aero MEDEVAC [medical evacuation], so some number have use and that is for the warfighter to decide.

The thing we wrestle with in the current contract is that if we accept fewer than 15 per year we incur a cost penalty and 12 is the minimum that we can accept. So, we were supposed to be accepting three per month. We have lessened that. We are at 2.2 on average. And at the end of calendar year 2020, we plan to go down to 1.25. So, sticking at that 15 so we don't incur a cost penalty and so what we are balancing is the original contract that awarded everything. So, with the EMD [Engineering and Manufacturing Development], it was all the production lots with pre-negotiated pricing and if we failed to award, we lose that pricing. And so that is why we really want to get the RVS fixed as quickly as we can so that the fix cuts into the line. We can ramp up production. We can go to full rate and be excited about the tanker that we have.

Mr. WITTMAN. Let me talk a little bit about B-2 modernization. Last year, when you were before the committee, you said this, you said for programs like the B-2, we have to keep the ability to penetrate. We can't take risks there until the B-21 fields.

If you look at the FY21 [fiscal year 2021] budget, we see that there is some risk because you recommend moving away from the B-2 [Defensive] Management System and not fielding it after \$1.9 billion of investment into that system.

The question is, do you still see the same risks that exist with having the variety of systems necessary to be able to penetrate? Do you believe that this \$1.9 billion investment was the wrong investment, was not necessary? And where does that leave us today with having the ability to bridge that capability until we fully field the B-21?

General NAHOM. And sir, I will start out with this one and when we get into particulars on the DMS-M [Defensive Management System Modernization], I will probably turn it back to Roper for his assist in that.

But first of all, on the bomber fleet, there is nothing more important to the Air Force. And if you look at what the bombers bring, no one else brings that. Our joint partners don't bring it. Our coalition partners don't bring it. And when you look at long-distance volumes of fires that you alluded to in your opening statement, that is the bomber force. The future of the bomber force for the Air Force is in a B-21 and a heavily modified B-52 and that is what we are looking towards.

When you look at making that jump to great power competition, getting to that two-bomber fleet in the future is very important for the Air Force and keeping those two programs on track.

When you look at the B-1 and B-2, they are very important, too, because there are some capabilities we need in the interim until we

get there. For the B-2 specifically, its ability to penetrate, as well as its nuclear strategic deterrence mission. And the B-1 in just sheer volume of fires.

Talking about the B-2 first, we need to keep the B-2. We need to keep it until we have a B-21 that is nuclear certified, and that is going to be about 10 years from now. And we have a commitment in that platform.

In terms of the DMS-M, it is a program that was slowed. Also, there were some difficulties in the program. I will ask Dr. Roper to comment on that as soon as I finish with this. But when we look at that, we actually have ways we think we can mitigate that and what I would like to do is come back in a classified setting and talk more specifically about that because I think there is ways we can save money and apply that to B-21 and B-52 modernization and mitigate that risk in the interim.

The B-1 is trickier. One of the problems of the B-1, we have used that airplane and overused it over many years and it is broken in many ways. And I will also have Dr. Roper comment on that because there is some engineering aspects of that that I think are very important.

When you look at the B-1s right now at Ellsworth and Dyess, and you look at the mission-capable rates, and you look at the numbers of airplanes that are beyond service life and what it would take to recover those airplanes, going into this when we looked at the B-1 we said there is probably some number of those that we probably should take offline so we can use the same number of maintainers to concentrate on the airplanes that are more easily recoverable, more efficient to recover to a flying status. We did some very deep analysis and we think the number is 17 and that is within our President's budget.

By taking the fleet down by 17 airplanes, that takes the worst actors offline and lets the maintainers now concentrate on the airplanes that have a better road to recovery. We think by doing this, we will get the mission-capable rate to a more acceptable level. The intention now is to hold that B-1 level until that fleet shakes hands with the B-21 when the B-21 becomes operational. And we think that is a good path forward on the bomber to save some of the funds for great power competition while keeping some near-term capacity moving forward.

Dr. Roper, I will turn it over to you for the DMS-M particulars.

Secretary ROPER. Yes, DMS-M, yes, too many acronyms in the Defense Department for me. When we were first tackling that problem, and I have been with that team three times and I am headed down to meet with them again tomorrow, I was hoping that what they had to do was the same thing we had to do on the OCX [Next Generation Operational Control System] which is the ground control station for GPS [Global Positioning System] that hit a brick wall and couldn't go further or Air Operations Center [AOC] 10.2. It is a shift the entire Department is doing, but we are really leading an aggressive charge in the Air Force and that is shifting from waterfall software development where you deliver code in huge chunks that are years apart to a process that is called agile or DevSecOps which is really fast spirals. It is something all of indus-

try, defense industry is struggling with and it is just the way code exists in commercial industry.

So, for programs like OCX and then AOC 10.2 which became the software factory Kessel Run, so if you have been to that, you know it actually feels like you are in a software company. You learn the process. You write good code. You win. So, we hope that that would be what we need to do for the B-2.

The B-2 had something else, and so we experienced a 6- to 8-month slip just to get the agile process in place. But unlike AOC 10.2, now Kessel Run, we are not deploying code to new computers. We are deploying them to old computers and the run time, the embedded systems on those computers are simply not known. And so, developers at Northrop Grumman who write good code in their development environment take it out to the jet and it doesn't run. And it is not their fault. It is that there are nuances on the jet that were unknown and now they have to debug them. They have to work regression testing and that drove a lot more time because the upgrade is significant. It is a system of systems that have to work together.

And the lesson we learn out of this is that if we want to do a major modernization in the future and deploy onto old computers, the embedded systems are going to eat our lunch. Right? The lesson we learned on B-2 is a lesson we are going to learn every time. And as long as we are maintaining old systems, it is something that is going to bite us if we have to keep it relevant.

The good news—and I know having to de-scope a program is not good news, but there is a lasting benefit from this—is we went out and tried to figure out how do we not have this happen again. And there is a technology that is very new and you may not have heard of this. It is called containerization or Kubernetes. It is an open-source development technology that is being driven by Google and other major companies. And it is amazing. And it solves the problem that we experienced on B-2. And I won't bore you with the technical details, but in a nutshell, it ensures that code runs the same way bit for bit on any kind of computer. And to demonstrate it, we actually went from a development laptop to the F-16 recently with no steps in between and code ran exactly the same way.

So, this containerization trend which you can imagine makes sense for the Internet of Things, you want to deploy code to the world of connected things and have it run in a predictable way. It is going to help solve a lot of our problems. Unfortunately, it was a technology that wasn't trending when this program began and we've learned a lesson the hard way, but it is a lesson that I don't intend to learn again.

Mr. WITTMAN. Thank you, Mr. Chairman. I yield back.

Mr. COURTNEY. Thank you, Mr. Wittman.

Mr. Norcross.

Mr. NORCROSS. Thank you, Chairman. Dr. Roper, General, it is good to have you here. As he mentioned, we were out in Washington to look at the KC-46.

So, a couple of areas I want to just look at a little bit closer. Class 1 deficiencies, as I understand them, it is the tie-down system which an approval for the fix has been made, correct? The second one is the boom, the stiffness, which comes back on us, has the

responsibility on working on that; and obviously, the 800-pound gorilla is the RVS system which, as Joe had mentioned, we got a deep dive.

The bad news is we had to do it. The good news is we now have the latest, most up to date that we would not have if this was on its original schedule. So that is a good thing. I believe we are going to come to an accommodation that works for us shortly and that is a relative term to where we are at, which is the good news.

Would you explain to us if we decide to delay the purchase of additional planes in addition to the cost factor you were talking about, how does Boeing, once that new system for visual is approved, how do we make that up if we are postponing the purchase of planes?

Secretary ROPER. And sir, just to understand, do you mean taking acceptances all the way to zero or—

Mr. NORCROSS. Yes.

Secretary ROPER [continuing]. Taking them down to the minimum amount. So, if we go below 12 per year, then we break the contract.

Mr. NORCROSS. A sure number. And as I—it is on Boeing's dime, right?

Secretary ROPER. It is. So sir, all the retrofitting, the designing, that is on Boeing's nickel. But one of the things that has been tough on KC-46 is because everything is wrapped up in a firm-fixed-price contract where the government doesn't get insight into design, we are not getting taskings, we are not approving things. It really puts the reins in the contractor's hands. I am not saying that is a bad practice for everything, but for something unprecedented like an RVS, hasn't been done before, in hindsight it is a very bad business model to work with industry.

Mr. NORCROSS. I think Boeing would agree with that.

Secretary ROPER. Given the billions that we are in, and the fact that we have got a plane that our pilots like flying, it is good for mobility, it is good for MEDEVAC, but we just have this bad RVS system. We have got to play this forward. And so I feel kind of like I guess a closer in baseball that I am inheriting a lot of runners, but we have to get out of the inning and we are closer to getting out of the inning than starting a new game.

Mr. NORCROSS. And the production line is going to be much quicker retrofitting that one piece than waiting to build the entire plane.

And to Mr. Wittman's comment, I agree with that. It seems counterintuitive that you want to purchase a plane that is not ready. But that time to retrofit it is much less.

Secretary ROPER. Yes, sir. That is why we would like to go down to the minimum that preserves our airplanes and the pricing. As we come to resolution with Boeing on design, we would like whatever needs to be retrofit, if it could be put in the production line before the whole fix. So those prudent things so that the retrofit can be done.

And then, of course, there is an art to retrofit. Do we fly all the planes in or do we do it as part of the maintenance cycle? Those are all things that are in the reins of Air Mobility Command to decide, but the thing I am now feeling positive about is we are reach-

ing agreement on what constitutes a working RVS in a way that involves numbers.

Mr. NORCROSS. The retirement of the KC-135s and KC-10s, consideration of not having capacity is going to be huge here. How are we mitigating that with the budget containing those cuts? And are you considering outside resources for refueling in order to make up for that? General.

General NAHOM. Sir, as we bring on the KC-46 with the limited capability we have right now and we start retiring some of our KC-135s and KC-10s, these are very difficult decisions and certainly nothing we would want to do.

Obviously, we know that as we take air refuelers offline that we can use, we are incurring risks for the combatant commanders in current day operations. There is certainly a look towards the future of what we need our Air Force to look like in great power competition. Just like the bomber, the two-bomber fleet, we are going to be a future of a two-tanker fleet, the KC-46 and the KC-135 moving forward. And there is some divestment that has to happen to make room in both money and people and in some cases ramp space as we move forward. So, we are watching that very closely.

We know as we let KC-135 and KC-10s go to the boneyard as we retire them, we know that we are incurring the risk because of the condition of the KC-46 and that is why we are trying to work very closely with the combatant commanders and the users for that near-term risk.

I will say that with the KC-10s, probably more important that we actually keep that on schedule because of the manpower and the ramp space limitations. The KC-135, we have done some things. If you are familiar with Pease [Air National Guard Base] and North Carolina at Seymour Johnson [Air Force Base], where we have Active Duty association, so Active Duty airmen in those Guard and Reserve units, we have actually—are pulling out those Active association manpower out, so we can actually put them in the broader KC-135 environment. That way we can transition Pease and Seymour Johnson to the KC-46 with their limited ability to perform the refueling mission and still use those airmen to keep some more KC-135s out of the boneyard. So, we are doing some things to help mitigate the risk, but it is going to be a difficult discussion going forward.

I will say though when we looked at this President's budget, we did have to balance risk across all portfolios. There were some things we did that were very uncomfortable, canceling one of our hypersonic initiatives, accepting less fighters than we would have liked, certainly some of the munitions we weren't able to get after. And this certainly is indicative of that.

I think the last thing I will say is that we have set for—when we go back to the Air Force We Need study and 386 operational squadrons. We know that the Air Force we have right now is too small for what is being asked of our Air Force, from our Nation. The size of the tanker fleet is certainly indicative of that, of an Air Force that is just not big enough right now to do all the missions that are being asked of it.

Mr. NORCROSS. Thank you. I yield back.

Mr. COURTNEY. Mr. Conaway.

Mr. CONAWAY. Thank you, Mr. Chairman. General, you may have answered this, my question, when you were talking to Mr. Wittman, but the bomber vector going from B-1, B-2s to just B-52s and the new B-21, looks like you are retiring older planes and keeping—you are retiring younger planes and keeping older planes flying for 100 years. Is that in your answer on the B-1s?

General NAHOM. It wasn't, sir. I will tell you, I will let Dr. Roper comment on this as well, but what is interesting about the B-52 is these are old airplanes, but they are relatively young in terms of flying hours. Many of these airplanes sat a lot of nuclear alert through the Cold War and have relatively low hours on them in comparison. And so there is, if you look at that, what we need a bomber to do and what we can do with the B-52, with the Civilian Engine Replacement Program, the CERP, as well as the new radar and some of the new digital backbones, we are going to be able to do things with that airplane that we would not be able to do with a B-1 and a B-2. And I will let Dr. Roper comment on that as well.

Secretary ROPER. Thanks, General. I think Indiana Jones said it is not the years, it is the mileage and very much applies to airplanes. The B-1, particularly, has been an eye opener for me because I usually have been a high-tech developer for most of my career, so coming into this Air Force job you get a lot of sustainment. I have learned a lot about it. But going through those first five tails with General Ray where we realized that some of the bombers were much harder flown, they required much more aggressive inspections to keep them flying in operations, and that trying to maintain that level of operational availability was just a disproportionate tax on the fleet. So that then started the look at, is there a break point that would allow us to retire a number of airplanes so that we could raise the readiness of the remaining fleet because you are maintaining things that are easier to maintain.

Mr. CONAWAY. Okay. Well, then how is the re-engineering going on the B-52? Is it on schedule, on budget?

Secretary ROPER. Sir, it is going well. So, this is one where we were able to start the program much, much earlier because of the authorities, rapid prototyping authorities that Congress granted us. So perfect in the wheelhouse for that because the first step in the program is using digital engineering to start representing the engine mating with the aircraft.

We will release the RFP [request for proposal] for the engines this year, so we have got Boeing designing the power pod. We will get the engine vendors mating their digital twin with Boeing's. And then the step after that is the physical prototype. Only after that will we move to a formal major program. The prototyping helps us de-risk going into it. So, this is just a great case of fly before you buy, but in this case, flying for us is the digital twinning. It is playing that same de-risking role.

Mr. CONAWAY. All right. And then where are you going to base the B-21 and when will we know that?

General NAHOM. The B-21 right now, sir, Ellsworth, Dyess—Ellsworth, Whiteman, and Dyess where your currently B-1 and B-2 fleet are.

Mr. CONAWAY. So, you will split them at all three?

General NAHOM. They will be split between the three, yes, sir.

Mr. CONAWAY. And then for the uninitiated, I was in the Army, not in the Air Force, the second category problem with the KC-46 is the telescoping can thing. I understand RVS being brand spanking new, but for those who are uninitiated, why is it that we have got a problem with that telescoping can that isn't a problem in other booms that we have been doing for 50 years?

Secretary ROPER. Yes, sir. It's a good question. So, the tanker fleet we have now is old. So, it works. It has been built for the legacy fleet. This is the first time we have done a new boom in a while.

Boeing designed the boom for the international standards called 7191 where other tanks are built for. It has I think 1,400 pounds of pressure and that is good for almost every airplane we have except the A-10. So, the A-10 needs something that is closer to 600 to 800. And so, we needed to deviate from that international standard for the A-10 and so that is where the requirements change came from us.

Mr. CONAWAY. So, the current tanker fleet can refuel the A-10s with the old booms?

Secretary ROPER. It can and what I wish had been known is that the current tanker fleet, because it is not new, was not designed to that international standard. It was designed below it. So, what has to be done is just change out the actuator in the boom so that it is softer for the push.

Mr. CONAWAY. Okay, and that will get done before the RVS?

Secretary ROPER. Yes, sir. It is straightforward engineering.

Mr. CONAWAY. Thank you, Chairman. I yield back.

Mr. COURTNEY. Thanks, Mike.

Mr. Gallagher.

Mr. GALLAGHER. What a surprise. You have lost your reinforcements on the left. So, I want to pull the string on the B-21 issue a little bit if we can because as I understand it the Air Force plans to purchase no less than a hundred B-21s. Correct?

General NAHOM. Correct.

Mr. GALLAGHER. So then assuming that B-21 program that will arrive on schedule with the projected delivery date of mid-2020s, I guess the question is what number of operational B-21s will be sufficient to retire the B-1B and the B-2A bombers and approximately what year will that be? I don't know who wants to take that.

General NAHOM. You know, as you look at the B-1 fleet, and a fleet now which is going to be less, 44 aircraft moving straight across, these are the decisions, I would say there is probably a little bit of unknown in that because the B-21 right now is on track and doing very well, but there will be some challenges going forward. So, we know that we are going to get the B-1 fleet and we divest.

Now just like we do at any base with any airplane, there will be as the first B-21s goes into the—the first site, there will be a transition period where that base will bring down their B-1s and will bring in their B-21s. There will be a transition just like the F-35s are happening at Burlington right now. The F-16s have gone away. The F-35s are showing up. The crews are retraining and all that is going to happen. So, there will be a transition and that will go

base to base. So you will have the first base will start somewhere like you said, mid to 2026, 2027 timeframe when the first aircraft show up. After that transition, then you go to the next base and then the next, so there will be an overlap.

When that exact last B-1 flies out and goes to the boneyard, I think there is a window that is probably somewhere in the late 2020s, early 2030s, and I think there is enough of a variable right now, I probably couldn't pin it down just yet. Sir, anything to add to that?

Mr. GALLAGHER. Fair enough. And I think the concern would be if the B-21 gets delayed, right? Are we then going to have to invest a little bit in B-1 in order to preserve long-range strike?

General NAHOM. Absolutely. And the airframes that are left, the 44 airframes that are left, we are investing and making sure they have the airframe and the avionics they need to carry that long-range strike through the 2020s. And we are going to have to do that.

Mr. GALLAGHER. We heard yesterday or—I am losing track of time we have had so many of these hearings—I think it was yesterday. Secretary Esper told us that DOD is currently updating op [operations] plans in light of the National Defense Strategy [NDS]. For example, the first post NDS integrated naval force structure assessment is currently under review by the Secretary and it is likely the fleet will not see significant changes from its—will see significant changes from its pre-NDS force structure assessment.

Given that the planned buy of a hundred B-21s was established prior to the NDS, does the Air Force have any plans to revisit that number in light of the NDS's focus on higher end threats and great power competition with China, in particular?

Secretary ROPER. Sure, I mean, I think the thing we are doing with China and Russia in our face, we are re-looking at everything. I mean the thing I am really proud of the Air Force and now Space Force for doing this last year was really taking a hard look at what it takes to compete and to win against an adversary like China. And that was basically my job when I was in OSD [Office of the Secretary of Defense]. It is wonderful being part of a whole service doing it.

You know, roles and missions when you are fighting a peer are going to be different than fighting a non-peer or a low-end violent extremist, so I think the things before the NDS all of them are on the table to be re-looked at.

General NAHOM. And I will say that the number 100 was always the minimum. And if you look at the Air Force we need starting at 386 operational squadrons, that number is—the number of total bombers is over 200 and that would be, if you look at the number of B-52s we will have left, that will be a larger fleet than 100 on the B-21.

Secretary ROPER. And it is very clear range and capacity really matter in the future fight.

Mr. GALLAGHER. Dr. Roper, I was mentioning earlier when I ran into you in Silicon Valley a little bit ago, if you wouldn't mind, talk a little bit about your efforts of outreach there and how they have borne fruit in terms of reaching out beyond defense primes and some of those relationships that you have built in Silicon Valley.

Secretary ROPER. I really appreciate the question. This is some of the most fun work that I am doing right now in the Air Force. And the thing we are up against is we are only 20 percent of R&D [research and development], so 20 percent of this Nation's R&D is in defense. And so, the opportunities are increasingly in commercial tech and of course, you are well aware the Defense Department has not made great inroads with Silicon Valley and commercial startups.

And the thing that has been fun is trying to reset the relationship by showing that we can speed up our purchasing system, that we can use our military market to aid commercialization. So last year, we did 15 events that we call pitch days where we can have a startup pitch to us and we can put them on contract that same day and pay them that same day which is night and day difference based on the defense procurement system of the past. That has gone a long way to opening up the doors with private investors and venture capitalists [VCs] who now view our quote investment arm, the one that is making early-stage contracts with startups, viewing it as an early market delineator. And so, we have brought hundreds of millions into Air Force programs just from VCs saying well, that company is on contract with the Air Force. They have got a chance of commercializing using the Air Force market; I probably need in.

This is the year we are going to try to go big and go with scale, but the valuable trend I am seeing is the way that China is engaging in Hong Kong is opening up a window of opportunity. And startups and investors are starting to view—taking Chinese money differently than they did in the past.

And now is the perfect time for the military to come in as an investment partner of choice because we are not owning equity, right? And we are a different market than the commercial one. We can pay a higher price point and we don't need things in the same quantity. So right now, rather than a startup or a scale-up thinking working with defense is hard and slow, I hope that they think in future that is the natural first step.

Mr. GALLAGHER. Thank you. I am way out of time.

Mr. COURTNEY. Thank you. So, I guess Mr. Kelly was here when the gavel came down just before—

Mr. KELLY. Thank you, Mr. Chairman. You know, I acquisitioned programs across all four services, DOD. I am a lawyer by profession, but I wouldn't practice contract law because I don't know what I am doing. And we seem to think that fighter jockeys or that great infantry generals are going to be great acquisition guys to write these contracts. We get taken to task on these things. And we have got to stop that.

You know, it makes no sense that we have to take 12 planes or we have to pay a penalty, yet we have to pay for planes that don't meet the requirements that we ask for and there is no penalty. That makes absolutely—we have to get professional lawyers. We contract a lot in the military. Maybe we need to contract some good contract lawyers to do acquisition. And that is just a comment. I will leave that.

But I want to get into, I recently flew into Iraq on an Illinois National Guard C-130. It was not the J model. I was also in Rota a

few days later and there was a C-17 Mississippi National Guard tail sitting there. I say all that to say the current distribution of older C-130Hs and the newer 130Js seems out of balance throughout the total force. Air National Guard and Air Reserve C-130 squadrons comprise 76 percent of the Air Force's B-130 fleet, but only 15 percent of Reserve Component units are flying the modern C-130Js. However, every Active Duty C-130 squadron, 100 percent, are fortunate to fly the C-130Js.

What are your plans to correct this imbalance and make C-130 recapitalization and modernization proportional and concurrent as recommended by the 2014 National Commission on the Structure of the Air Force?

General NAHOM. Sir, C-130s is—first of all, thanks for the question. C-130s is a tough topic. We ask a lot of that community. They are incredible what they do. The whole tactical airlift community is just amazing. We have about 300 C-130s in the fleet right now. You are right. The C-130Hs are all in the Guard and Reserve. And as we look through the year, we actually have an exciting year because this year based on the congressional gifts and we thank you very much on the C-130Js, this year we are going to announce three new locations that are currently flying C-130Hs to transition to the C-130Js. Two of those were previously planned. One of them is kind of a new one because we were going to transition Martin State [Airport, home of Maryland Air National Guard 175th Wing] out of the A-10 into a C-130J and because of some other moves we are doing with the A-10 right now, we are actually going to leave Martin State in the A-10 and we are going to take those C-130Js and turn those into another C-130H unit. So, we are transitioning some units.

For the C-130Hs that are left—the units that are left in the C-130H, we are actively upgrading those aircraft with obviously the safety of flight with the center wing box as well as AMP [Avionics Modernization Program] 1 for the compliance, AMP 2 for the modernized cockpit. And then in some cases, the 3.5 motor and the NP2000 propeller system.

Mr. KELLY. That is good, but I have got one more question and it kind of fits into the same thing, so you can kind of finish. But despite Air Force plans to continue utilizing the C-130 for at least 20 more years, the Department has seen fit not to request funds for C-130H modernization or new C-130Js for the Guard and Reserve.

I realize reprogramming happened at the OSD level and not your level, but what is the operational risk incurred by the recent programming or fund intended for new C-130J aircraft for the Air National Guard?

General NAHOM. Sir, in terms of the additional C-130Js, I don't believe it is going to be an operational impact, although we have to look and see how that is going to impact the units that we are going to be transitioning to the J. And we are working through those numbers right now.

The tactical airlift community, I think we are actually on a good road right now between the C-130Js, the upgrades of the C-130Js and the modernization of the C-130Hs. I think we actually have a good laydown of what we want to do with the C-130 community.

We do think there is room to reduce some of the C-130s and you will see that in our budget. And what we are doing, we are working very closely with the Guard and Reserve looking at units that are currently flying C-130Hs and seeing what other flying missions we need to bring into for modern Air Force. And we are working unit by unit to make sure we actually have a good fit and that is how the Martin State—

Mr. KELLY. And I am going to reclaim the last 20 seconds, but I want to be real. We ask a whole lot of our Guard and Reserve units and they in strategic air in C-17s and C-130s and KC-135s and KC-46s and we always get—we are asked to do the missions on old equipment over and over again. And we provide the majority of the force, but we always seem to make them second-class citizens when it comes to fielding. And we don't need to do that.

We need to make sure our airmen, whether they are Guard, Reserve, or Active Component, when they deploy downrange and do missions, we ought to have the best. And I just ask that we pay attention to that because it seems like the C-130Js that were scheduled are now cut out which means they will probably never get those because they were told to wait and then we will field you. And now they are being told well, we are not going to field you.

So, I yield back, Mr. Chairman.

Mr. COURTNEY. Thank you, General.

Mrs. Hartzler.

Mrs. HARTZLER. Thank you. I just want to foot-stomp what my colleague just said about the C-130s. Of course, Missouri has one of those units there at Rosecrans, so I just want to put that on your radar for your consideration of the Js as you are looking at another place there because this divesting of the Hs could impact this unit potentially and so a few questions. Will the C-130Hs that have already received new engines and propellers remain in service?

General NAHOM. Ma'am, that would be the intention. What we will look at is if we do divest the C-130H units, we will obviously divest the oldest aircraft that are not modified and we will make sure the airplanes that have all the upgrades and have that life left, 10, 15, 20 years life left, those are the ones we will keep moving forward.

Mrs. HARTZLER. That is good. You touched on this a little bit, but the question about what's the recapitalization and modernization plan for the entire C-130H fleet, can you kind of summarize that again and when will the Air Force release a force structure plan?

General NAHOM. Right now, the C-130Hs, we do think we can reduce the C-130Hs based on as we balance risk across all portfolios. We know that the units are flying C-130Hs right now. Those airmen—that is where we make sure if we are going to reduce C-130Hs, what mission are we going to bring into those locations. And that is why we are actually going unit by unit seeing is there a better fit. And actually, we found leaving Martin State in the A-10. What you are going to see in the 2022 budget looking forward, we are actually going to—we will work with Congress on a couple of their locations we think we can bring different flying missions into those locations as we reduce the C-130H fleet to the size we think that balance risks across portfolio.

Mrs. HARTZLER. Got you. Will bases currently operating the C-130Hs receive the Js?

General NAHOM. Right. This year as we go through the strategic basing process, we are going to introduce three locations and we are going to use the entire C-130H enterprise to look at and we will score those appropriately and work very closely with your committee.

Mrs. HARTZLER. Beyond this year, like next year, are you going to be adding Js where Hs are?

General NAHOM. Well, right now, ma'am, we have the Js that we received based on congressional adds over the last few years. Those are the ones that are going to be moving into the H. In terms of the other units, without congressional adds the plan is to take the C-130Hs and upgrade those into the AMP 1 and AMP 2.

Mrs. HARTZLER. Okay, great. I have two and a half minutes left. So, I wanted to get to the B-2. We have had a lot of good discussion. Appreciate the questions already asked. Appreciate the information already presented. A lot has changed in a year. And I am trying to digest it myself.

Because at this hearing a year ago, I asked you, Dr. Roper, if the Air Force was committed to the DMS-M program and you answered in the affirmative. And now we are looking at proposal from you all to de-scope it and I received the classified briefing on that, so I understand why the decision was made, but unfortunately between the cancellation of the DMS-M and the previous cancellation of the B-2 advanced extremely high frequency satellite communications program, it just kind of gives a heartburn, raises red flags regarding the Air Force's commitment to modernizing the B-2.

In the testimony, you shared some of the modernizations that you are committed to this year, but I was wondering just from your own words, can you kind of summarize some of the modernization that this President's budget is still including for this year?

Secretary ROPER. Representative Hartzler, aside from the de-scoping of DMS, there is the Flexible Strike upgrade. There is the movement to M Code the military GPS unit upgrade, the common VLF [type of radio receiver] receiver, Mode 5, Mode S, the crash-survivable memory unit, and the radar-aided targeting system. So, all those, JASSM [Joint Air-to-Surface Standoff Missile] integration, signature, and LO [low observable] maintenance and improvements, all of those are still funded and—

Mrs. HARTZLER. Right.

Secretary ROPER. I know you are short on time.

Mrs. HARTZLER. Sure, sure. So, I want to go back to the cancellation last year of the advanced extremely high frequency satellite communications program because you are funding at \$215 million that same system on the B-52s. So, do we need that on the B-2 and how come you don't think it is necessary there?

General NAHOM. I would say in terms of the B-2 versus the—the B-2 obviously, we were committed to the B-2 until the B-21 could replace it because we have to have the B-2 and what that capability brings and the upgrades Dr. Roper referred to.

In terms of capability in the B-52 and long-term upgrades, the B-52, like the B-21, is the long-term solutions for our bomber

force. We want to make sure that we are continuing to upgrade the B-52 moving forward.

Mrs. HARTZLER. You sound like it is not necessary until the B-21 comes onboard, too expensive for the amount of time it would take, is that what you are basically determining?

Secretary ROPER. Based on how well the B-21 is doing, yes. If the B-21 were to slip and right now there is no reason to believe that it will, then I think we would reassess modernizing for the B-2. Like I say, it has to be our penetrating bomber until the B-21 is ready to replace it.

Mrs. HARTZLER. And I appreciate the chair's indulgence just for one quick question. If you could for the record get back with me, what do we get for our \$1.9 billion for DMS-M that now we are de-scoping? So I would like to know what we got for our money. Thank you.

[The information referred to can be found in the Appendix on page 55.]

Mr. COURTNEY. It is a very good question. So again, I think we have had actually a pretty efficient hearing here. We have covered a lot of topics. I want to again thank both the witnesses.

I actually just have one other followup along the same lines as Congressman Kelly and Congresswoman Hartzler which is again on the C-130s; again, it seems like it always falls in our lap to do the plus-up for the NP2000 propeller enhancements.

Again, I think a lot of us feel very strongly that based on other incidents that have happened in the Navy's C-130 fleet where you had loss of life because of propeller malfunction that this really is a safety issue. And it sort of is still a mystery to me why this is not really almost a program of record for the Air Force in terms of just doing what the Navy did which is just to go out and wholesale do this upgrade and enhancement.

So, I just want to get your comment on that.

General NAHOM. Sir, as we look at the NP2000 and obviously we like the performance enhancement on the NP2000. For the existing propeller on the C-130H fleet though, there is a risk to that but we are mitigating that risk through our maintenance action and our increased inspections. I will let Dr. Roper comment on that. There are some things we are doing with that propeller to make sure that we do mitigate that risk correctly.

Would we like to see NP2000s and 3.5 motors across the fleet? Yes. But it goes on to how we are balancing the money we have to make sure we have—we are balancing risks across all portfolios in terms of how we are modernizing. And right now, making sure the few NP2000s we have gotten, we prioritize those into the fleets that absolutely need the enhanced performance, the LC-130s on skis, the units in Wyoming and Nevada to fight fires and prioritizing those for upgrade.

As we look across the fleet when we see the C-130Hs we keep, we certainly want to look at what we can afford to put onto these C-130Hs because we would like to have the enhanced performance on all of them. But in the meantime we are pretty confident that we have mitigated the risk in the existing propeller housing. Sir, I'll let you comment on that.

Secretary ROPER. Mr. Chairman, the very unfortunate incident, and again, our prayers go out to those families, put a focus on how we do maintenance on legacy propellers. And two things were discovered: that there was a manufacturing change in the pre-1971 54H60 propellers that have now been pulled out of the fleet, and that we really needed to change inspection practices to go over corrosion and intragranular cracks more aggressively. So those inspection procedures have now been implemented across the Air Force and I am confident that they are sufficient to keep the legacy propeller working.

To General Nahom's point, having a higher performing propeller would be fantastic, but the budget we built, we took high priority efforts like our two hypersonics programs and had to cancel one because we were simply trying to balance risk across the mission. So, we made tough choices. I think in a different budget environment where there was more cash to go around, I think we would look at the propellers differently, but this was a risk-balancing case and if we could make the existing system, if we could sustain it safely and reliably for mission, then we had to go with that to get more modernization in for new systems.

Mr. COURTNEY. Well, thank you. I don't question your concern about the issue in terms of the risk that we are talking about, but again, Mr. Kelly did a nice job in sort of describing the workload that this fleet is carrying and I think a lot of us are concerned that we really want to err on the side of safety. So anyway, I am sure we will continue that discussion.

Mr. Wittman, do you have any other questions? Members?

Again, thank you, both. Really, this is very solid testimony, very helpful as we move towards the mark. And with that, we will close the hearing.

[Whereupon, at 4:25 p.m., the subcommittee was adjourned.]

A P P E N D I X

FEBRUARY 27, 2020

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

FEBRUARY 27, 2020

Chairman Courtney Opening Statement
“Department of the Air Force FY21 Budget Request for Seapower and
Projection Forces”
27 February 2020

The Seapower and Projection Forces subcommittee meets this afternoon to hear testimony on the Department of the Air Force’s Fiscal Year (FY) 2021 budget request. Before us today to discuss that request are Assistant Secretary of the Air Force for Acquisition, Dr. William Roper and Deputy Chief of Staff for Plans and Programs, Lieutenant General David Nahom. Gentlemen, thank you for being here today.

The bombers, tankers and airlifters under our oversight form the critical backbone of our ability to project force and support operations around the world. With increasing age and readiness challenges, the current fleet is already strained in meeting key warfighting requirements.

The Department of the Air Force’s budget request for 2021 proposes force structure cuts across these critical capabilities—retiring dozens of aircraft over the next five years—and asks to redirect large share of that money towards modernization and advanced capabilities.

The question for our subcommittee as we begin our work on the next NDAA is whether this budget request properly balances the investment in future capabilities with the risk being assumed by giving up already strained capacity today.

For example, the budget proposes to procure 15 new KC-46 tankers in 2021, while retiring 29 so-called “legacy” tankers. At the same time, the Air Force plans to continue accepting new KC-46s even as a fix to the ongoing problems with the Remote Visual System, a key element of the refueling capabilities of the tanker, is still being developed.

Just last week I had the opportunity to see the KC-46 program and the RVS system first-hand. That visit made clear to me that this is a fundamental hardware problem that must be resolved to make this system workable. I understand effort are underway to establish a path towards resolve these issues, and I hope we will see a clear plan soon.

While that process continues, however, the budget asks this committee to authorize the retirement of tankers as the aircraft meant to replace them cannot be flown operationally. Our mobility commanders are raising serious alarm about the critical gaps this will create in our aerial refueling requirements.

This subcommittee has been and will continue to scrutinize whether the Air Force’s stopgap plan is the right approach.

Similarly, I am concerned that the Air Force continues to lack a coherent plan for sustaining the tactical airlift capabilities of our Air National Guard. This committee has pursued a two-pronged approach on this important issue. First, directing congressionally directed investment in modernization efforts like

upgraded avionics, safety enhancing propellers and high-performance engines. And, second, pursuing congressionally-directed procurement of new C-130Js.

I say “congressionally-directed” because it has been Congress, and in many cases this subcommittee, who had led these efforts when Air Force budgets have failed to do so. That appears to be the case again, with a plan to replace 24 C-130H aircraft with 19 C-130Js in 2021, and no further plans to modernize or recapitalize the fleet beyond required electronics upgrades.

This remains a top concern of the subcommittee, and one we will address in the 2021 defense authorization bill.

With that, I would welcome any opening remarks from Ranking Member Wittman.

**Opening Remarks of the Honorable Robert J. Wittman
for the
Seapower and Projection Forces Hearing on
Air Force Projection Forces Aviation Programs and Capabilities Related to
the 2021 President's Budget Request
February 27, 2020**

I want to thank Chairman Courtney for yielding and thank our two witnesses for testifying today.

As we take a look at the budget request, it appears that this budget is only the beginning of an effort to address a great powers competition and that we have a long way to go. I am supportive of many of the efforts to divest certain legacy aircraft and use that funding as a down payment for future requirements—in fact, I have been encouraging all the services to do this. However, I remain concerned about two specific areas in the budget request, namely bombers and tankers.

As to bombers, we have been on this journey for several years. Because of the nature of future conflict, bombers will be an increasingly valuable asset over shorter range capabilities to ensure persistent operations in a contested environment. Giving credit where credit is due, the B-21 Raider looks like a promising capability and is tracking toward a timely delivery. However, as to our existing bomber force structure, I continue to have concerns with our B-1 Lancer low mission capable rates, the recommendation to not modernize the B-2 defensive management system and considerable uncertainty on the bomber roadmap, and I remain concerned about our ability to project long range strikes. Concerning the recommendation to retire certain B-1 bombers and not modernize the B-2, I look forward to a careful assessment of the budget request to ensure we retain adequate strike capability.

The tanker force structure may be the most perplexing element in the budget request. With a recommendation to retire certain KC-135 and KC-10 aircraft and a continued delay in delivering capable KC-46A aircraft, I think that we need to make significant changes. I do not understand why the Air Force continues to accept deficient KC-46A tankers that are not mission capable. We may be years away from an adequate capability. Yet the Air Force appears ready to enter into full rate production of a deficient KC-46A aircraft and has requested an astounding 15 KC-46A aircraft in the budget request. If Sen John McCain were here today, I am confident of his response. Considering the multi-year effort to fix KC-46A, I think it is time to slow down ordering AND delivery of deficient KC-46A aircraft and to retain adequate legacy tankers to ensure that we can provide adequate capability. It is not surprising that General Lyons, Commander US Transportation Command indicated last week that this budget request “creates a capacity gap with significant impacts to Combatant Command daily competition and wartime missions, and negatively impacts senior leader decision space for mobilization

when confronted with a crisis.” I agree with General Lyons and think it is time to reverse this dangerous trend.

Again, I appreciate the Chairman for having this important hearing and I yield back the balance of my time.

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UNITED STATES HOUSE OF REPRESENTATIVES

PRESENTATION TO THE
HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES
UNITED STATES HOUSE OF REPRESENTATIVES

HEARING DATE/TIME: February 27, 2020, 3:30 PM

SUBJECT: Air Force, Force Structure and Modernization

STATEMENT OF:

Dr. William B. Roper, Jr.
Assistant Secretary of the Air Force
(Acquisition, Technology & Logistics)

Lt. Gen. David S. Nahom, USAF
Deputy Chief of Staff
(Plans and Programs)

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INTRODUCTION AND STRATEGIC ENVIRONMENT

Chairman Courtney, Ranking Member Wittman, and distinguished members of the subcommittee, thank you for having us here today to provide testimony on Department of the Air Force modernization. Additionally, thank you for your leadership and dedication to rebuilding the United States military. Together, in recent years, we have made clear gains in improving wartime readiness and setting the tone for modernization, but there remains work to be done.

As the nature and sources of conflict throughout the globe have become more diverse and less predictable, our Nation continues to face a complex set of current and future security challenges, including the resurgence of great power competition from China and Russia. It has become clear that supremacy in the air and space domains—a given for any U.S. military operation since the end of the Cold War—can no longer be assumed and, in some cases, is very much at risk. The National Defense Strategy shifted our prioritization to the high-end fight and reflected this changing nature of warfare.

Today, the Department of the Air Force has fully embraced Secretary of Defense Esper's goal of irreversible momentum toward National Defense Strategy implementation. The Department of the Air Force must be ready to compete, deter, and win in this rapidly changing and increasingly complex security environment; defend the homeland; provide a safe, secure, and effective nuclear deterrent; and be able to defeat a powerful conventional enemy while we deter opportunistic aggression in another theater; and continue to disrupt violent extremists. We must continue on the path to develop a future force that will prevail in each and every domain.

CURRENT CAPACITY AND CAPABILITY

The Department of the Air Force conducted an exhaustive review of our portfolios and made hard decisions to better align with the National Defense Strategy, which includes the

acceptance of calculated short-term risk. Some difficult choices require the divestiture of legacy platforms in exchange for capability needed for the future. Our decisions are supported by learning from multiple, complex wargames to assess alternative warfighting approaches against a peer adversary. Our modernization investments—focused on connecting the Joint force, dominating in space, generating combat power, and conducting logistics under attack—reflect the new strategic reality.

Bomber / ICBM Force Structure

The future of our bomber force relies on the B-21 and a heavily modified B-52. The Department of the Air Force will continue to invest and modernize the B-1 and B-2 fleets until the B-21 fleet is delivered in sufficient quantities. 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. As you know, nuclear deterrence is the highest priority mission of the Department of Defense – our deterrent underwrites every U.S. military operation around the world as is the foundation and backstop of our national defense.

B-21

The National Defense Strategy provided strategic direction to develop a new stealth bomber, and the B-21 Raider is the answer. The B-21 has a mature and stable design and has transitioned to development of the first test aircraft. The B-21 is driving an early focus and investment in DevSecOps and agile software processes to foster system flexibility as well as an affordable and smooth transition to an organic sustainment capability. The Air Force identified Dyess Air Force Base, Texas; Ellsworth Air Force Base, South Dakota; and Whiteman Air Force Base, Missouri as the preferred locations for the B-21 Raider. The final basing decision is

expected in 2021 following compliance with the National Environmental Policy Act (NEPA) and other regulatory and planning processes. The FY21 Budget requests \$2.9 billion (\$26.5 billion across the Fiscal Years Defense Plan (FYDP)) to continue Engineering Manufacturing and Development.

The B-21 will be a highly survivable asset with the ability to penetrate modern air defenses to accomplish mission objectives in an anti-access/area denial environment. We will need a minimum of 100 B-21s in our inventory. We are also pursuing legacy bomber fleet upgrades in order to keep those assets sustainable and viable, which is necessary until the B-21 becomes operational in sufficient numbers. The Department of the Air Force is committed to building a minimum of 100 B-21s with an average per unit cost of \$550 million (BY10) / \$639 million (BY19).

B-52

While the last B-52 Stratofortress entered service in the United States Air Force in 1962, we expect to continue operating the B-52 through 2050. We will continue to invest in modernization programs to keep the platform operationally relevant. Major modernization efforts include the Commercial Engine Replacement Program (CERP), \$2.0 billion across the FYDP; Radar Modernization Program, \$1.2 billion across the FYDP; and Combat Network Communications Technology (CONNECT), \$51 million across the FYDP; and installation of Advanced Extremely High Frequency (AEHF) secured satellite communication capabilities, \$215 million across the FYDP.

The Department of the Air Force's number one priority for the B-52 is to ensure platform viability through 2050 and the CERP is critical to achieving this goal. CERP will replace legacy engines (TF33-PW-103) with new commercial engines using Middle Tier Acquisition processes

to remove more than three years from the traditional program schedule. Additionally, CERP is more complex than just a standard commercial engine refit. CERP includes new engines, flight systems, and cockpit throttle and displays. The Radar Modernization Program is also necessary to ensure viability through 2050 and will modernize the current Strategic Radar (AN/APQ-166), which is based on 1960s technology modified in the 1980s.

B-52 Combat Network Communications Technology (CONNECT) provides an integrated communication and mission management system, as well as a machine-to-machine interface for weapons retargeting. CONNECT's digital infrastructure and architecture provides the backbone for the 1760 Internal Weapons Bay Upgrade, which allows for internal carriage of J-series weapons through modification of the Common Strategic Rotary Launchers. This significantly increases 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. Finally, the integration of the long-range standoff (LRSO) nuclear air-launched cruise missile and AEHF will ensure the continuation of the B-52's role in the airborne leg of the Nuclear Triad. The Air Force remains committed to B-52 modernization to ensure the Nation's oldest and most versatile frontline long range bomber remains relevant through at least 2050.

B-1

The B-1 is a long-range, supersonic multirole bomber capable of flying intercontinental missions with the largest payload of guided and unguided weapons in the Air Force inventory. Our B-1 force has relentlessly delivered 18 years of continued combat airpower in support of global Combatant Command requirements. Now, we must rebuild our combat capacity in order to provide a lean and lethal B-1 force to combatant commanders. To do so, we will retire 17 B-1s

in FY21 to allow the Department of the Air Force to focus available resources on sustaining and modernizing the remaining combat-coded B-1s. The goal is to retire the most challenging aircraft to sustain in order to improve readiness of the remaining fleet. We will continue to invest in B-1 modernization and sustainment to ensure the platform remains lethal and viable until B-21s are operational in sufficient numbers. The Integrated Battle Station upgrade, \$66 million across the FYDP, will enhance crew situational awareness and precision engagement capabilities and is the B-1's largest modernization effort ever. The first aircraft with this upgrade was delivered in January 2014. The last six aircraft will be completed in summer of 2020. Other efforts to update the B-1's communication systems are ongoing and ensures the B-1 remains the backbone of the Air Force's long-range bomber force.

Lastly, the B-1 is the Air Force threshold platform for the Long Range Anti-Ship Missile (LRASM). Integration of this weapon, coupled with the B-1's long range, high speed and large payload capacity, postures the B-1 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 until the B-21 is operational.

Delays in the troubled Defensive Management System modernization effort have limited the operational utility of the system by the time it would be fielded. Therefore, the Air Force will abandon the full Defensive Management System modernization and instead pursue a reduced effort to upgrade the cockpit display system, required to replace unsustainable cathode ray tube displays.

The Air Force has completed 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 Flexible Strike capability will begin fielding this year as part of the B-2 P6.2 block effort, which includes Military GPS User Equipment and B-2 hardware to support carrying the B61-12 weapon. The Air Force began installing the Common Very-Low-Frequency / Low Frequency (VLF/LF) Receiver and will complete fielding the system in all 20 B-2 aircraft in FY20. This program provides the B-2 with a VLF/LF receiver for secure, survivable, strategic communications capability. Other on-going B-2 modernization programs include enhancement of the Identification Friend or Foe (IFF) system, replacement of the Crash Survivable Memory Unit, integration of hardware upgrades for employment of the B61-12 nuclear weapon, and software upgrades to allow the B-2 to carry the extended range variant of the Joint Air-to-Surface Standoff Missile (JASSM-ER). The Radar Aided Targeting System software upgrade began development in October 2018 and will provide improved navigational handoff to weapons in a GPS-denied environment. Finally, the B-2 will continue sustainment efforts, \$132 million across the FYDP, for the on-going Low Observable Signature and Supportability Modification effort, to improve aircraft maintainability and availability.

Intercontinental Ballistic Missile Modernization

Intercontinental Ballistic Missiles (ICBMs) are the backbone of U.S. nuclear deterrence. The Department of the Air Force is in the initial stages of replacing this 1970s-era ICBM capability with the Ground-Based Strategic Deterrent (GBSD). The GBSD is the most cost-effective option for modernizing the ICBM leg of the Nuclear Triad and supports the National Defense Strategy to modernize the capability of nuclear forces. The GBSD will extend and improve the capabilities of the ground-based leg of the Nuclear Triad, providing a responsive deterrent capability against current and future adversaries through 2075. It also will provide more efficient operations, maintenance, and security by modernizing critical infrastructure and by decreasing lifecycle costs. Deployment is scheduled to begin in the mid-2020s in order to resolve capability, attrition, and age issues with the current Minuteman-III weapon system, as well as meet warfighter requirements. The Nation is investing \$15.3 billion during this FYDP on these new missiles, infrastructure, and their accompanying re-entry systems.

Tanker Fleet

Tankers are the lifeblood of our Joint force's ability to respond to crises and contingencies quickly and are essential to keeping our Department of the Air Force fueled as a global force. At the end of FY20, the tanker fleet will be comprised of 398 KC-135s, 56 KC-10s, and 52 KC-46s that provide the backbone of rapid U.S. global operations. We have accepted 31 KC-46s and will receive a total of 179 KC-46 Pegasus aircraft while we continue to divest the aging KC-10 and KC-135 fleets and look towards the next generation for tanker recapitalization options.

KC-46

While we continue to sustain the current tanker capability, building the future tanker fleet remains one of the Air Force's top acquisition priorities. The KC-46 will deliver greater

operational readiness, flexibility, and survivability to the Global Reach mission. The Air Force awarded Lot 5 on 27 September 2019, increasing the number of production aircraft on contract to 67. The Lot 6 contract for 12 aircraft is projected to award in May 2020.

The first KC-46 aircraft was delivered to McConnell AFB, Kansas (Main Operating Base 1), on 25 January 2019. The Formal Training Unit at Altus AFB, Oklahoma, received its first KC-46 on 8 February 2019. The Department of the Air Force established Main Operating Base 2 at Pease Air National Guard Base, New Hampshire, on 8 August 2019. The Department of the Air Force will continue taking delivery of KC-46s at a rate of approximately three per month through FY20, at which point the delivery rate will reduce to approximately 1.25 per month. The Department of the Air Force began dedicated Operational Test and Evaluation on 14 May 2019, executed the first Operational Test flight on 4 June 2019, and formally transitioned into Initial Operational Test and Evaluation (IOT&E) on 23 October 2019.

Partnered with Air Mobility Command, we have worked hard to accept the KC-46 while ensuring its major deficiencies—the Remote Visual System (RVS) and stiff air refueling boom—are properly addressed without undue burden on taxpayers or warfighters. We established a subject matter expert team that derived critical performance parameters for both the RVS and boom and codified these parameters in legally-binding agreements with Boeing. Due to the extensive nature of the fixes, especially the RVS, design solutions to both issues will take three-to-four years to develop, and additional time to fully retrofit across our fleet.

The Department of the Air Force remains committed to holding Boeing accountable to fix deficiencies identified in both developmental and operational test and evaluation of the KC-46's effectiveness, suitability, and mission capability. We remain concerned with Boeing's slow progress resolving issues limiting the KC-46's ability to accomplish all missions and will

continue to work with Boeing to ensure the KC-46 meets all essential mission requirements. The Department of the Air Force is withholding up to \$26.5 million per aircraft. If applied to all 67 aircraft on contract, withholds could be as high as \$1.8 billion. The Department of the Air Force will not pay for capability not delivered.

Despite its current deficiencies, the KC-46 is safe to operate (adhering to flight manual cautions provided to our operators) and will be the Department of the Air Force's best tanker for contested environments due to enhanced situational awareness, battle management, and threat countermeasures. Accepting the KC-46 with known deficiencies permitted initiation of familiarization and operational test activities while the Department of the Air Force works with Boeing on long-term efforts to correct deficiencies. Accepting the KC-46, and fixing deficiencies in parallel with operational test and evaluation, is the fastest way to achieve full operational capability to meet warfighter requirements.

The FY21 Budget requests \$106.3 million in RDT&E funding for the ongoing KC-46 Engineering and Manufacturing Development and post production modification efforts, to include the boom telescope actuator redesign effort resolving the stiff boom deficiency. Additionally, the FY21 Budget requests \$3.1 billion in procurement funding to award Lot 7 (15 aircraft plus associated spares, engines, support equipment, and wing air refueling pods).

KC-10 and KC-135

The average age of our KC-135 and KC-10 tankers is 58 and 35 years old, respectively. Both fleets are challenged by aircraft parts obsolescence and diminishing manufacturing source issues. We are able to maintain these platforms as effective and safe weapon systems for the warfighter with the help of organic Department of the Air Force depots and industry. We are

executing several key modernization, safety, and compliance initiatives to ensure our KC-135 fleet remains viable through at least 2045.

The FY21 Budget requests \$88.25 million to continue KC-135 modernization efforts. The Block 45 program addresses supportability, reliability, and maintainability issues with legacy flight and engine instruments by integrating a digital flight director, autopilot, radar altimeter, and electronic engine instrument display for our operators. Additionally, the Rudder Position Indicator program enhances safety of the KC-135 by providing the aircrew with situational awareness for the actual rudder position.

Furthermore, the FY21 Budget also requests \$7.1 million through the FYDP to keep our KC-10 fleet operational through its planned retirement, and includes funding for service bulletins and low cost modifications to ensure Federal Aviation Administration certification.

The Department of the Air Force took measured risk in FY21 tanker capacity in order to resource the capability we need for the future fight. As we look to better align the Department of the Air Force with the National Defense Strategy, divestments were accelerated in both the KC-135 and the KC-10 fleets. Specifically in FY21, the Department of the Air Force is divesting 16 KC-10s and 13 KC-135s from the Active Duty fleets.

Presidential Airlift

VC-25B

The VC-25B program will replace the U.S. Air Force Presidential VC-25A fleet, which faces capability gaps, rising maintenance costs, and parts obsolescence as it ages beyond 30 years. The VC-25B program will deliver two new aircraft to meet the requirements for the President to execute the roles of Head of State, Chief Executive, and Commander-in-Chief. Two Boeing 747-8 aircraft will be uniquely modified to provide the President, staff, and guests with safe and reliable

air transportation with an equivalent level of communications capability and security available in the White House. The modifications to the 747-8 aircraft will include an electrical power upgrade, dual auxiliary power units that are usable in flight, a mission communication system, an executive interior, military avionics, a self-defense system, autonomous enplaning and deplaning, and autonomous baggage loading. The program successfully ferried both commercial 747-8 aircraft to the San Antonio modification facility in April 2019 and completed aircraft removals, jacking, and cribbing ahead of schedule. The program also completed the System Critical Design Review in January 2020.

The FY21 Budget requests \$800.9 million to continue Engineering and Manufacturing Development, start aircraft modifications, and begin Product Support activities. The budget adds funding in FY21 to fix FY19 shortfalls and realigns out year funding to match program requirements.

Other Presidential Airlift Modernization

C-32

The Department of the Air Force and the Navy are engaged in a combined Analysis of Alternatives to recapitalize the National Military Command System fixed-wing airborne layer and large capacity Executive Airlift fleets. This study encompasses the E-4B National Airborne Operations Center, C-32A Executive Airlift, and E-6B Airborne Command Post/Take Charge and Move Out aircraft and missions. These platforms are aging and increasingly difficult to support. The study explores the realignment of missions among platforms and examines potential benefits of acquiring common airframes without sacrificing operational effectiveness or increasing overall costs. The Department of the Air Force and the Navy expect to complete the effort in the March 2020 timeframe. C-32 Recapitalization is currently in the Materiel Solutions

Analysis Phase and is not a formal acquisition program. The FY21 Budget requests \$9.9 million for Materiel Solution Analysis activities, Technology Maturation, Risk Reduction, and to develop a Capability Development Document for the C-32 recapitalization program.

Strategic Airlift

C-5

The C-5 Super Galaxy provides all-weather worldwide strategic airlift for combat forces, equipment, and supplies, exemplifying Rapid Global Mobility outlined in the National Defense Strategy. Current investment programs focus on fleet obsolescence, maintainability, and safety of flight.

The FY21 Budget requests \$71.8 million in procurement funding, predominately for communications, navigation, surveillance/air traffic management (CNS/ATM) and C-5 core mission computer/weather radar (CMC/WxR) system equipment. CNS/ATM upgrades include Automatic Dependent Surveillance-Broadcast (ADS-B) Out modifications required for global airspace compliance. The CMC/WxR effort replaces an antiquated radar system with diminishing manufacturing sources and upgrades the core mission computer processor to meet the demands of future software modifications.

Additionally, the FY21 Budget requests \$32.6 million in RDT&E funding to support replacement of the Multifunctional Control and Displays (RMCD). This comprehensive sustainment modification mitigates the obsolescence of the current control and display units and increases capacity for future technology integration into the cockpit.

C-17

The C-17 is the only aircraft in the Department of the Air Force inventory that combines tactical capability with strategic range to operate from austere airfields. The fleet of 222 aircraft provides our Nation unmatched flexibility to conduct theater and inter-theater direct delivery, airdrop, aeromedical, and special operations airlift missions. 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 FY21 Budget requests \$107.4 million in procurement funding to continue critical modifications to the C-17 fleet. This includes Identify Friend or Foe for the identification and control of military aircraft, and Large Aircraft Infrared Countermeasures defensive systems. The sustainment modification effort 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. Additionally, \$10 million of FY21 RDT&E funding will address obsolescence and flight safety issues. 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 Department of Defense communication infrastructure.

Tactical Airlift

The C-130 fleet consists of legacy C-130H and newer C-130J aircraft, as well as special mission aircraft (AC/LC/EC/MC/HC/WC-130s). 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.

C-130H

The Department of the Air Force continues to modernize the C-130H legacy fleet through a four-pronged approach emphasizing aircraft safety, airspace compliance, modernization, and partial recapitalization. Our C-130H Center Wing Box replacement program breathes new life into some of our hardest flown aircraft, enabling them to continue to safely operate well into the future. The C-130H Avionics Modernization Program (AMP) Increment 1 ensures the legacy fleet is outfitted with modern communication equipment and complies with U.S. and international airspace transponder mandates and the Department of the Air Force is on track to complete these upgrades in FY21. The AMP Increment 2 program improves the C-130H fleet maintainability and reliability by providing a new digital avionics suite, and mitigating obsolescence and diminished manufacturing source challenges. The FY21 Budget requests \$42 million in RDT&E and \$5.9 million in procurement funding to support the legacy C-130H fleet.

As with other weapon systems, the Department of the Air Force is taking acceptable risk in the C-130 portfolio as it focuses resources toward the future force. Specifically, in FY21 the Department of the Air Force is divesting 13 C-130H from the Air National Guard (ANG) inventory. Also in FY21, aided by the decision to retain A-10s at the Maryland ANG base in Baltimore, the Department of the Air Force is able to execute the planned transfer of eight C-130Js from Active Duty to the ANG. Additionally, thanks to the support of Congress, the ANG will be receiving 11 new C-130Js from Lockheed Martin to recapitalize 11 C-130Hs.

C-130J

The Air Force is also partially recapitalizing the legacy C-130H fleet with C-130Js, which specifically supports our Special Operations missions by providing Special Forces with extra weight carrying capacity, longer range, and better fuel efficiency. These 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). In addition to purchasing new aircraft, the Department of the Air Force has multiple modification efforts for the C-130J, including Center Wing Box replacement, Large Aircraft Infrared Countermeasures, and an accelerated avionics upgrade to meet 2020 Federal Aviation Administration and international airspace mandates. The C-130J Block 8.1 modernization program, currently in production, delivers new communication and data link capabilities, a modern flight management system, and other key capabilities to the field. In addition, the Department of the Air Force plans to upgrade both our C-130H and C-130J fleets with a Mobile User Objective System satellite communication system to ensure we maintain key communication links anywhere in the world.

The FY21 Budget requests \$10.7 million for C-130J RDT&E and \$140 million for C-130J procurement and modification efforts. It also requests \$24.7 million for HC/MC-130J RDT&E and \$423.6 million for HC/MC-130J procurement and modification efforts.

FUTURE CAPABILITY

Competing against rising peer adversaries during this time of unprecedented technology change requires a competitive acquisition system: one that is faster and more agile than our rivals. Consequently, the Department of the Air Force is transforming what we buy, how we buy, and who we buy from to retain the battlefield dominance we presently enjoy.

Faster Acquisitions

Fielding systems faster is step one. Through rapid prototyping authorities granted by Congress, like Middle Tier Acquisition, we are trimming non-value-added steps that previously bogged down programs and slowed capability to warfighters. In May 2019, we achieved our goal of removing 100 years of excess time from program schedules. Since then, we have reached 125

years on our way to 150 this summer. Rapid prototyping—“flying before you buy”—is not just a faster acquisition approach; it allows risks to be tackled earlier, before systems are in production when there is still time to troubleshoot. The benefit is proving out in our 55 MTA programs, which maintain the same documentation and discipline as traditional programs. We thank Congress for this invaluable authority and will continue to report our status tri-annually.

Another accelerant is DevSecOps software development. With the establishment of our Program Executive Office for Digital, Chief Software Officer, and over 60 agile coding teams spanning both traditional programs (e.g., F-16, F-22, and B-21) and new development “factories” (e.g., Kessel Run, Kobayashi Maru, Space Camp, and LevelUp), the Department of the Air Force is scaling modern software practices where cycle times are now weeks, even days. To accelerate even further, we are fielding common infrastructure that all programs can leverage. “cloudONE,” our enterprise cloud, and two coding platforms, “platformONE” and the Kessel Run platform, currently provide enterprise-wide coding environments employing leading commercial technologies, like containerization and Kubernetes, increasing the reliability and security of our code. Programs like F-16, F-22, B-21, and GBSD are leveraging this pre-accredited infrastructure to develop faster and more securely.

Another accelerant is digital engineering, which is revolutionizing the design and production agility of new programs like T-7A, GBSD, and Next Generation Air Dominance (NGAD). As future threats become increasingly difficult to predict, NGAD is employing digital engineering to replace once-in-a-generation, mass-produced fighters with smaller batches of iteratively-upgraded platforms. Dubbed the “Digital Century Series”, the approach takes a cue from the digital transformation of the automotive industry, using high-fidelity models to troubleshoot design, assembly, maintenance, and cost before physical systems exist. The goal is

to end the learning curve cost of modernization so that future aircraft—as well as satellites and weapons—can rapidly adapt to changing threats in a way legacy Major Defense Acquisition Programs cannot. We are excited about our progress and look forward to sharing the details with Congress in a classified setting.

Smarter Acquisitions

Faster acquisitions go hand-in-hand with smarter ones. Leveraging new technologies and new industry practices that increase program quality and agility is essential to compete long-term. One area of smarter acquisition not often highlighted is sustainment innovation. The average aircraft flown by the Air Force is 23 years old, and systems like the C-5, KC-135, and B-52 are even older at 33, 58, and 58 respectively. These aging fleets face significant readiness challenges as approximately sixty percent of their supply chain is single-source or, increasingly, unsourced. To fill the gap, our Rapid Sustainment Office is developing, transitioning, and training Department of the Air Force maintainers to use technologies found in smart manufacturing. Artificial intelligence, robotics, and additive manufacturing (i.e., 3-D printing) are now being used at scale to lower costs and speed-up repairs for our warfighters. To date, the Department of the Air Force has certified over 2,000 additively manufactured parts, cold spray repairs at our depots, and predictive maintenance for 5 systems with 11 more joining this year—saving cost while increasing readiness. This summer we will host our first Advanced Manufacturing Olympics, a challenge-based competition showcasing current fleet readiness problems and awarding contracts to organizations who solve them. We are excited to take the next step in on-demand manufacturing with new industry and academia partnerships.

Another area of smarter acquisition is our work with startups, small businesses, and private investors. With over eighty percent of our nation's research and development (R&D) now

commercial—and our Defense Industrial Base continuing to shrink through mergers and acquisitions—transforming the way we work with commercial companies is imperative. In 2018, we began energizing our Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR) to lower barriers for commercial tech companies, speed contracts, and bring private investment into the Defense market. In 2019 alone, we awarded over 1,000 contracts worth \$240 million to 700 companies, with over half new to the government; conducted 15 “Pitch Days” that awarded \$77 million in same-day contracts; and induced over \$400 million of private investment matching for companies receiving Department of the Air Force awards. With more improvements coming this year, we will formally launch this new “Air Force Ventures” process at scale so that tech companies can depend on us as an early innovation partner of choice.

Another example of smarter acquisition is Agility Prime, a non-traditional program seeking to operationalize commercial electric vertical takeoff and landing (eVTOL) vehicles (i.e., “flying cars”) for military missions and potentially accelerating the emerging commercial market. The Department of the Air Force has unique testing and safety resources—and revenue-generating military use cases—to help mitigate present commercial market and regulatory risks. Agility Prime will use these resources, vice significant R&D funding, to attract investors, build confidence, and hopefully expedite commercialization, all while providing warfighters with revolutionary flexibility for numerous missions. Transforming our acquisition system from a mere purchaser to an innovation partner is key for accelerating dual-use technology and countering the advantages of state-sponsored industrial bases. We appreciate the support of Congress on this effort, including the additional \$25 million it appropriated in the FY20 Defense Bill.

Connecting the Joint Force

One effort that will stress how fast and smart our requirements, acquisition, and operations process can move is Joint All-Domain Command and Control (JADC2) powered by the Advanced Battle Management System (ABMS). Charged by the Secretary of Defense with leading the concept development for JADC2, the Department of the Air Force is building a militarized “internet of things (IoT)” to connect any sensor with any shooter—across all domains—with the required digital infrastructure for data analytics and artificial intelligence to fight at machine speeds.

Because of the complexity, risk must be retired more quickly and routinely than traditional programs to avoid “snowballing” and failure. Taking a cue from DevSecOps, which iteratively develops and deploys thin “slices” of minimally-viable code that stack into greater capabilities while providing user feedback each cycle, ABMS will develop and deploy military IoT-type connectivity—things like cloud, data management, and software-defined radios and networks—in hardware-software slices designed for upgradeability, vice point performance. Concepts and systems will be iterated in four-month cycles that culminate in live-fly experiments.

Our first experiment in December 2019 connected Air Force aircraft, Space Force sensors, Navy surface vessels and aircraft, Army air defense and fire units, and a Special Operations Team for the successful defeat of a simulated cruise missile. Led by U.S. Northern Command, 26 of 28 connectivity objectives were met, including the first connection of an F-35 with an F-22 via a translating gateway called “gatewayONE”. However, the failures were more important than the successes: failing and fixing fast is the core acquisition principle.

Our Department of the Air Force FY21 Budget request includes additional resources for ABMS and its digital backbone, Enterprise Information Technology as a Service, comprising 28 development projects, like the aforementioned gatewayONE, and continued experimentation, the next of which is this April under U.S. Space Command, U.S. Northern Command, and U.S. Strategic Command sponsorship. We are committed to working with our Joint and Allied Partners so that existing systems can join easily. We ask Congress to support this capability so that future operators on the battlefield enjoy the same empowered connectivity they presently enjoy at home.

Thank you again for the opportunity to testify before this Subcommittee. The dialogue we have today will help us design, build, and operate a force capable of fighting and winning now and in the future.

Dr. Will Roper

Dr. Will Roper is the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics. As the Air Force's Service Acquisition Executive, Dr. Roper is responsible for and oversees Air Force research, development and acquisition activities totaling an annual budget in excess of \$40 billion for more than 465 acquisition programs. In this position, Dr. Roper serves as the principal advisor to the Secretary and Chief of Staff of the Air Force for research and development, test, production and modernization efforts within the Air Force. In addition to his Air Force responsibilities, Dr. Roper is the Service Acquisition Executive for the Joint Strike Fighter.

Prior to his current position, Dr. Roper was the founding Director of the Pentagon's Strategic Capabilities Office. Established in 2012, the SCO imagines new—often unexpected and game-changing—uses of existing government and commercial systems: extending their shelf-life and restoring surprise to the military's playbook. Since 2012, SCO has grown from an annual budget of \$50 million to the current \$1.5 billion request in the President's 2018 budget with projects spanning new concepts such as hypervelocity artillery, multi-purpose missiles, autonomous fast-boats, smartphone-navigating weapons, big-data-enabled sensing, 3D-printed systems, standoff arsenal planes, fighter avatars and fighter-dispersed swarming micro-drones which formed the world's then-largest swarm of 103 systems. During his tenure as SCO Director, Dr. Roper served on the Department's 2018 National Defense Strategy Steering Group, Cloud Executive Steering Group and Defense Modernization Team.

Previously, Dr. Roper served as the Acting Chief Architect at the Missile Defense Agency where he developed 11 new systems, including the current European Defense architecture, advanced drones, and classified programs. Before this, he worked at MIT Lincoln Laboratory and served as a missile defense advisor to the Under Secretary of Defense for Acquisition, Technology and Logistics.

EDUCATION

2001 Bachelor of Science in Physics, Georgia Institute of Technology, Atlanta

2002 Master of Science in Physics, Georgia Institute of Technology, Atlanta

2010 Doctorate in Mathematics, Oxford University, England

CAREER CHRONOLOGY

January 2006 – June 2010, Missile Defense Advisor, MIT Lincoln Laboratory, Washington, D.C.

August 2010 – August 2011, Member, Missile Defense Advisory Committee, Missile Defense Agency, Washington D.C.

June 2010 – August 2012, Acting Chief Architect, Missile Defense Agency, Washington D.C.

August 2012 – February 2018, Director, Strategic Capabilities Office, Office of the Secretary of Defense, Washington, D.C.

February 2018 – present, Assistant Secretary of the Air Force for Acquisitions, Technology and Logistics, Headquarters U.S. Air Force, Washington, D.C.

Lieutenant General David S. Nahom

Lt. Gen. David S. Nahom is the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, the Pentagon, Arlington, Virginia. In support of the Chief of Staff and Secretary of the Air Force, he leads the development and integration of the Air Force resource allocation plan. As the Air Force's senior programmer, he leads the development, integration, evaluation and analysis of the Air Force Program across the Future Years Defense Plan. He directs and coordinates activities ensuring the Air Force builds and employs effective air, space and cyber forces to achieve national defense objectives.

Lt. Gen. Nahom was commissioned through the Reserve Officer Training Corps at the University of Colorado and is a distinguished graduate of both undergraduate navigator training and Euro-NATO Joint Jet Pilot Training. During his 31-year active duty Air Force career, the general commanded at the squadron, group and wing level and is a command pilot with more than 3,400 hours in the F-22A, Raptor, F-15A/B/C/D Langley-Eustis, Va. Eagle and F-111F Aardvark.

In addition to his flying and command experience, Lt. Gen. Nahom is a graduate of the U.S. Army Command and General Staff College and the NATO Defense College. He has held headquarters-level assignments at NATO Combined Air Operations Center Six, U.S. Forces Korea, Pacific Air Forces, Headquarters Air Force and Air Forces Central Command. Prior to his current assignment, the general was the Director of Programs, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters Air Force, the Pentagon, Arlington, Virginia.

EDUCATION

1988 Bachelor of Arts, Economics, University of Colorado, Boulder
 1993 Squadron Officer School, Maxwell Air Force Base, Ala.
 2001 Army Command and General Staff College, Fort Leavenworth, Kan.
 2001 Master of Military Operational Arts and Science, Fort Leavenworth, Kan.
 2006 Air War College, Maxwell AFB, Ala., by correspondence
 2009 NATO Defense College, Rome, Italy

ASSIGNMENTS

November 1988-August 1989, Student, Specialized Undergraduate Navigator Training, Mather Air Force Base, Calif.
 September 1989- October 1989, Student, AT-38 Fighter Lead-In Training, 436th Tactical Fighter Training Squadron, Holloman AFB, N.M.
 November 1989- May 1990, Student, F-111 Replacement Training Unit, Mountain Home AFB, Idaho
 June 1990- February 1993, F-111F Weapons Systems Officer, 492nd TFTS, RAF Lakenheath, United Kingdom
 March 1993- July 1994, Student, Euro-NATO Joint Jet Pilot Training, Sheppard AFB, Texas
 August 1994- October 1994, Student, Introduction to Fighter Fundamentals, Columbus AFB, Miss.
 November 1994- June 1995, Student, F-15C Fighter Training Unit, Tyndall AFB, Fla.
 July 1995-September 1997, Aircraft Commander, Mission Commander, 71st Fighter Squadron, Joint Base Langley-Eustis, Va.
 September 1997-December 1999, Flight Lead, Chief Squadron Scheduler, Operations Support Squadron, JB Langley-Eustis, Va.
 December 1999-June 2000, F-15C Instructor Pilot, Assistant Director of Operations, 95th FS, Tyndall AFB, Fla.
 June 2000-July 2001, Student, Army Command and General Staff College, Fort Leavenworth, Kan.
 September 2002-June 2003, Chief Wing Training, F-15C Instructor Pilot, 33rd Operations Support Squadron, Eglin AFB, Fla.
 June 2003-August 2005, Assistant Director of Operations, Director of Operations, 60th FS, Eglin AFB, Fla.

August 2005-June 2006, Chief of Wing Safety, 33rd Fighter Wing, Eglin AFB, Fla.
 June 2006-August 2008 Commander, Deputy Commander for Maintenance Group, 60th FS, Eglin AFB, Fla.
 July 2008-January 2009, Student/Senior Course Member, NATO Defense College, Rome, Italy
 June 2010-July 2012, Commander, 18th Operations Group, Kadena Air Base, Japan
 July 2012-March 2013, Executive Officer to Commander Pacific Air Forces, JB Pearl Harbor-Hickam, Hawaii
 March 2013-August 2014, Commander, 3rd Wing, JB Elmendorf-Richardson, Alaska
 September 2014-October 2015, Director of Regional Affairs, Deputy Under Secretary of the Air Force, International Affairs, Headquarters Air Force, Arlington, Va.
 November 2016-April 2017, Deputy Director of Plans, Programs and Requirements, JB Langley-Eustis, Va.
 April 2017-May 2018, Deputy Commander, US Air Forces Central Command; Deputy, Combined Force Air Component Commander, US Central Command, Southwest Asia
 May 2018-September 2019, Director of Programs, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters Air Force, the Pentagon, Arlington, Va.
 September 2019-present, Deputy Chief of Staff, Plans and Programs, Headquarters Air Force, the Pentagon, Arlington, Va.

SUMMARY OF JOINT ASSIGNMENTS

July 2001-July 2002, Chief of Fighter Operations, NATO Combined Air Operations Six, Eskisehir, Turkey, as a major
 February 2009-June 2010, Chief J37 Training, Readiness, and Exercises Division, U.S. Pacific Command, Yong San, Seoul, South Korea, as a colonel

FLIGHT INFORMATION

Rating: command pilot
 Flight hours: more than 3,400
 Aircraft flown: F-22A, F-15 A-D, AT-38, T-38, T-37 and F-111A/F

MAJOR AWARDS AND DECORATIONS

Defense Superior Service Medal with oak leaf cluster
 Legion of Merit with oak leaf cluster
 Distinguished Flying Cross with oak leaf cluster
 Defense Meritorious Service Medal
 Meritorious Service Medal with three oak leaf clusters
 Air Medal with four oak leaf clusters
 Aerial Achievement Medal with three oak leaf cluster
 Air Force Commendation Medal with oak leaf cluster
 Air Force Achievement Medal with two oak leaf clusters

EFFECTIVE DATES OF PROMOTION

Second Lieutenant Aug. 13, 1988
 First Lieutenant Aug. 13, 1990
 Captain Aug. 13, 1992
 Major Dec. 1, 1999
 Lieutenant Colonel April 1, 2004
 Colonel July 1, 2009
 Brigadier General Oct. 17, 2014
 Major General June 2, 2018
 Lieutenant General Sept. 4, 2019

(Current as of October 2019)

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

FEBRUARY 27, 2020

RESPONSE TO QUESTION SUBMITTED BY MRS. HARTZLER

Secretary ROPER. The displays architecture developed in the DMS-M program of record will be leveraged to field the upgraded displays, and the program is evaluating optimal reuse of the developed software. Also, since the 2017 strategy pivot that leveraged other program hardware in DMS-M development, government programs could potentially benefit from shared hardware design upgrades, obsolescence refresh, and expanded vendor throughput which improves the ramp rate to production. Overall, the Air Force learned that agile software constructs are difficult to apply to legacy architectures, as the B-2 legacy architecture proved troublesome when applying the agile approach to DMS-M development. The Air Force will better account for integration of new technology and software on legacy platforms in the scope for major modernizations. [See page 18.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

FEBRUARY 27, 2020

QUESTIONS SUBMITTED BY MR. CONAWAY

Mr. CONAWAY. The B-1 is often described as the work horse the Air Force because of its versatile and evolving mission capabilities. While I understand the challenges with the fleet and these decisions, it is still concerning to see the Air Force's proposal to retire 17 of these aircraft without stronger justification.

In order to better understanding the Air Force's decision, would you be able to provide us with the specific 17 B-1s proposed for retirement, including number of hours flown for each aircraft, last time the B-1 was flown, whether it was ever deemed "unsafe to fly", specific issues for the retirement of any particular B-1 and estimated cost to address those problems?

Furthermore, if the Air Force retires the 17 aircraft, what is the current and proposed configuration for the remaining B-1 fleet? Specifically, in the terms of the number of Primary Mission Aircraft Inventory, Primary Training Aircraft Inventory, Primary Development/Test Aircraft Inventory, Backup Aircraft Inventory and Attrition Reserve for each Air Force Base.

Secretary ROPER and General NAHOM. [Note: AF/A8 coordinated with SAF/AQP on this response.] The proposal to retire 17 B-1 aircraft was not driven by the specific maintenance status of individual aircraft, but by a need to balance risk and affordability within the B-1 fleet. The Air Force considered divesting a range of B-1s, and determined that 17 was the optimal figure. Divesting 17 aircraft maximizes maintenance and depot affordability (including the new structural repair line) for the remaining B-1 fleet, and frees resources for investment in future Air Force capabilities, while ensuring that no B-1 squadrons close and balancing risk to the Air Force's support to Combatant Commanders. The Air Force, at this time, has not identified which specific B-1 aircraft will be retired; however, the B-1 System Program Office (SPO) and Air Force Global Strike Command (AFGSC) have determined that the primary consideration in most cases will be the time-to-need for major structural repairs. For example, there are a number of B-1s that are already in need of a major structural repair and currently require in-depth inspections every 200 hours until a permanent repair can be applied. These B-1s would almost certainly be among those retired in order to avoid these recurring inspections, and the cost and depot workload associated with installing a permanent repair. At the time we finalized the FY21 budget, the most likely tails to be retired resulted in a loss of 10 from Dyess Air Force Base and 7 from Ellsworth Air Force Base. AFGSC intends to make the net impact 9 from Dyess and 8 from Ellsworth by shifting individual aircraft between bases as required, once retirements actually occur. Once the specific 17 B-1 aircraft are identified, by tail, for retirement, the Air Force will be able to provide the specifics of hours flown, previous discrepancies, and estimated costs.

The current and proposed configuration for the B-1 fleet is as follows:

[The information referred to was not available at the time of printing.]

Mr. CONAWAY. If the Air Force retire B-1s, what is the plan to improve readiness for the remaining fleet, including addressing current or potential structural problems? In addition, what is the Air Force's goal to for the B-1 Mission Capable Rate and the plan to achieve and sustain that goal? Furthermore, the Air Force has indicated plans to retain all B-1 maintenance billets. How many billets does the fleet currently have? How many billets are currently filled, and what, if any, are the plans to fill all B-1 maintenance billets?

Secretary ROPER and General NAHOM. [Note: AF/A8 coordinated with SAF/AQP on this response.] The proposed divestment of 17 B-1s is directly tied to the Air Force's effort to improve readiness for the remainder of the B-1 fleet. The divestment enables this readiness recovery by:

- Retaining all B-1 maintenance personnel, improving the ratio of maintainers-to-aircraft
- Funded maintenance billets will meet or exceed Logistics Composite Model (LCOM) requirements for the remaining B-1 fleet size
- Improved ability to handle routine, daily maintenance needs
- Enables continuing upgrade training of B-1 maintainers

- Enables the future transition from B-1 to B-21 without sacrificing B-1 maintenance
- Freeing depot-level maintenance workload
 - Defers the need for the first major structural repairs until FY23
 - Allows increased focus on near-term, less severe structural repairs
- Freeing approximately \$1.2B over the FYDP, helping to fund:
 - Ongoing B-1 sustainment and modernization
 - B-21 research and development

In addition to the above impacts of the proposed divestment, AFGSC has directed changes in the day-to-day operation of the B-1 in order to maximize its life. These changes include the elimination of low-altitude high-speed operations, the reduction of flying gross weights, and a reduction in the maximum number of flight hours per year, per aircraft, to better balance flight hours across the fleet. Further, full-scale fatigue testing will further inform the future viability of the airframe, potentially necessary repairs and identify maintenance trends which will aid in increasing and sustaining mission capable rates. As of 17 Mar 2020, B-1 Maintenance Requirements (billets) and assigned manning are:

	Funded Billets	Assigned	% Manning
RegAF			
Officer	16	13	81.3%
Enlisted	2,145	2,113	98.5%
Civilian	17	14	82.4%
USAFR			
Officer	2	2	100.0%
Enlisted	158	107	67.7%
Civilian	76	38	50.0%

The Air Force will continue accessing and hiring to the requirement. AF/A4 is developing a standalone Aircraft Maintenance Retention Strategy (as recommended by GAO report 19-160). This will establish retention goals by skill level based on loss and reenlistment rates. It will also address incentives aimed at changing behaviors and promoting retention within the AFSCs experiencing low retention. The outcome of these strategies will allow us to be proactive and attain our goal of filling all funded B-1 requirements.

Mr. CONAWAY. The Air Force's FY19 Research, Development, Test & Evaluation (RDT&E) Budget for B-1 was \$58,175,000. However, for FY20 the Air Force requested only \$1,000,000. Although the Air Force's plan for B-1 RDT&E increases to \$15,766,000 for FY21, the Air Force Budget documents show no funding at all for B-1 RDT&E in FY24 and FY25. Similarly, the Air Force's Budget documents for B-1 Procurement show only \$494,000 and \$503,000 for FY24 and FY25.

What is the Air Force's plan for upgrade and improvements to the B-1 fleet, including expanded carriage and hypersonic weapons capabilities? Why is the procurement funding so low for FY24 and FY25 and the RDT&E budget is non-existent?

Secretary ROPER and General NAHOM. The remaining B-1 fleet will continue to be modernized to ensure sustained relevance, lethality, and survivability to the extent necessary to ensure operational viability for the life of the aircraft, with investment weighted toward the near years of the FYDP. Current funded programs include Integrated Battle Station, installation of digital Identification Friend or Foe technology (Mode 5/S), required crypto modifications, and communications mods (Multifunctional Information Distribution System Joint Tactical Radio System).

QUESTIONS SUBMITTED BY MR. CISNEROS

Mr. CISNEROS. Secretary Roper, Advanced Battle Management System (ABMS), an effort to connect all forces to operate as a collaborative whole, is a priority for the Air Force, and the Joint Force. I agree this is a critical capability the Joint Force will need and am heartened to learn that others within DOD share the urgency. In his testimony to the Senate Armed Services Committee, NORTHCOM

Commander General O'Shaughnessy spoke at length about recent efforts by NORTHCOM, in partnership with the Services and other combatant commands, to hold the first ABMS demonstration. What is the Air Force's plan for the companies that performed at these demonstrations and how does the Air Force intend to maintain momentum for these partnerships?

Secretary ROPER. The Air Force will continue to assess new capabilities demonstrated at ABMS demonstrations for their operational utility and affordability. Based on that assessment, the Air Force will decide to either continue and iterate on the existing capability, pivot to a new approach, transition to a scaled program, or cancel altogether.

