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HEARING

ON

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2025

AND

OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS

BEFORE THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED EIGHTEENTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES HEARING

ON

FISCAL YEAR 2025 BUDGET REQUEST OF THE DEPARTMENT OF DEFENSE FOR FIXED-WING TACTICAL AND TRAINING AIRCRAFT PROGRAM

HEARING HELD
APRIL 16, 2024

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[There were no Documents submitted.]

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FISCAL YEAR 2025 BUDGET REQUEST OF THE DEPARTMENT OF DEFENSE FOR FIXED-WING TACTICAL AND TRAINING AIRCRAFT PROGRAM

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Tuesday, April 16, 2024.

The subcommittee met, pursuant to call, at 3:29 p.m., in room 2118, Rayburn House Office Building, Hon. Robert Wittman [chairman of the subcommittee] presiding.

OPENING STATEMENT OF HON. ROB WITTMAN, A REPRESENTATIVE FROM VIRGINIA, CHAIRMAN, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. WITTMAN. I want to welcome everybody to the Tactical Air and Land Subcommittee hearing today. This is convened to hear about fiscal year 2025 budget request from the Department of Defense's Fixed-Wing Tactical and Training Aircraft Programs. I want to thank our witnesses for being here today.

I am going to focus on the national defense strategy and the things that we need to do to accomplish that. Our effort today is to be able to make sure that we get to your questions. I know everybody here has an opening statement. We ask that you stay strictly to the three minutes.

We have votes coming up, which means right around four o'clock we are going to be called out, maybe a little bit later.

So what I want to do is I am going to put my comments in the record, and I am now going to recognize the ranking member, Mr. Norcross.[The opening statement of Chairman Wittman is available in the appendix on page 35.]

OPENING STATEMENT OF HON. DONALD NORCROSS, A REPRESENTATIVE FROM NEW JERSEY, RANKING MEMBER, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. NORCROSS. Thank you, Chairman, and for all the witnesses that have shown up today, I again will echo the statements of the chairman. I will put my formal remarks in. I just want to touch base on a number of issues that are coming up, and hopefully we can squeeze those in in the appropriate amount of time.

But the one thing I do want to mention when it comes to capacity is important, but capabilities is the driver for what we deal with each and every day. And that statement will become more relevant as we get into the question and answer.

With that, I yield back.

Mr. WITTMAN. Very good. Thank you, Mr. Norcross. I ask unanimous consent that the chairman and the ranking member be allowed to enter their opening remarks in the record. Hearing no objections, so ordered.[The opening statement of Ranking Member Norcross is available in the appendix on page 41.]

We will now to go to our witnesses, and we will allow the witness panel to begin in whatever order you all have preselected. The first one up, please give your comments. We ask that you stick to the three-minute clock, and we will keep time. It should be there in front of you as we start the clock.

STATEMENT OF ANDREW P. HUNTER, ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION, TECHNOLOGY, AND LOGISTICS, DEPARTMENT OF THE AIR FORCE

Mr. HUNTER. Thank you, Chairman Wittman and Ranking Member Norcross. Thanks for having us here today to provide testimony on the Department of the Air Force's fiscal year 2025 President's budget request for Fixed-Wing Tactical and Training Aircraft Programs.

As we testified last year, our operational imperatives work highlighted the challenges of integration and the importance of tight partnerships between the operational and acquisition communities in developing the necessary capabilities to deter and win future conflicts.

We look forward to working with Congress as we organize into a more agile and integrated acquisition system that delivers capabilities quickly and at scale for great power competition and ask your support for our budget request, including funding included for operational imperative initiatives.

We remain steadfast in resourcing these priorities, as well as others such as nuclear modernization. But our resources have been limited by the 2023 Fiscal Responsibility Act.

The impacts of the FRA [Fiscal Responsibility Act], combined with the delays of funding through continuing resolutions and restrictions on the retirements in weapon systems that do not meet our needs on a national defense strategy, divert the focus from our military's ability to deliver decisive combat at risk. Nothing could be more imperative than our need to receive timely authorization and appropriation of our fiscal year 2025 budget request.

This budget request continues our modernization efforts, such as the development of collaborative combat aircraft next generation air dominance platform, the advanced battle management system, our T-7 training aircraft, the E-7, and munitions. It also allows us to continue fielding platforms, like the F-15EX, the F-15 EPAWSS [Eagle Passive Active warning Survivability System], F-22 upgrades, and F-35 Block 4, as well as sustaining our current fleet.

I particularly want to highlight the CCA [collaborative combat aircraft] program as the exemplar of our efforts to develop and field new capabilities rapidly, affordability, and at scale. The CCA program is working to complete CCA Increment 1 concept refinement efforts, and we will notify Congress as we move forward with the vendors who will complete detailed designs, build prototypes, and test production representative test articles.

In fiscal year 2025, we will begin concept refinement for the next CCA increment as we also continue to explore international partnership participation.

Since time is of the essence in capability development, we are thankful to Congress for providing quick start authority through Section 229 of the fiscal year NDAA [National Defense Authorization Act]. Secretary Kendall highlighted a program just approved through quick start which will initiate work on providing C-3 battle management for moving target indication at scale.

This effort is an element of the operational imperatives funding request in fiscal year 2025, and the quick start authority allows us to begin some of that work now.

Thank you again for the opportunity to testify. We look forward to working with you and Congress, the committee, industry, and the communities that support us to defend the nation.

[The prepared statement of Mr. Hunter and Lt Gen Moore can be found in the Appendix on page 43.]

Mr. WITTMAN. Thank you, Mr. Hunter.

And now go to Lieutenant General Moore.

STATEMENT LT GEN RICHARD G. MOORE JR., USAF, DEPUTY CHIEF OF STAFF, PLANS AND PROGRAMS, DEPARTMENT OF THE AIR FORCE

General MOORE. Thank you, Chairman Wittman, Ranking Member Norcross, and other distinguished members of the subcommittee for the opportunity to testify today on behalf of the Department of the Air Force, and thank you for your continued leadership and your unwavering support of the U.S. military.

Today we are, as you know, in the midst of a difficult transition from a legacy force to one built to deter Chinese aggression and win against any peer competitor. Fiscal year 2025 represents another opportunity for the Department of the Air Force and the Congress to work together to remain the world's preeminent power projection force.

We cannot afford to stop short of achieving the force our nation needs. Our most valuable resources -- manpower, money, and time -- remain limited. We must be disciplined in our decisions and focus our investments on what we need most.

We do not want to get rid of aging airplanes, but in order to invest in modernized capabilities while maintaining the ability to keep our airmen ready, we must pivot both our resources and our airmen to the future. We have to stop funding things that do not measurably bring us closer to that goal.

Continuing to maintain our current force structure while simultaneously pursuing modernization is creating a drain on our resources. And those resources include our airmen and their readiness.

The Air Force's strategy is not to divest but rather to modernize. We must get past what is holding us back from being able to compete. In our FY [fiscal year] 2025 request, the Air Force remains focused on achieving a fight force mix that provides a capable, sustainable, survivable, and affordable force that can operate across a range of mission sets.

Most notably, our FY 2025 request seeks to preserve our advances in modernization while shaping future investments around long-range kill chains and the elements that support them. This contribution to the joint force is central to our ability to deter, and if necessary, defeat aggression.

We continue to make significant progress towards closing key capability gaps, but the hard choices are not behind us. We must consolidate the things that we need that are relevant to the future fight and make them the most relevant we can. We must remain united as a department and as a nation to successfully overcome barriers to change.

Time is our most valuable asset on the path to modernization, but it is not on our side. Our adversaries are watching, and we must act now to make the difficult choices that it takes to modernize. American lives and those of our allies and partners rely on our ability to deliver air superiority. We cannot fail in this endeavor.

We look forward to once again working with the Congress to shape a lethal force that efficiently and affordably provides the most capable air power for our nation. I am honored to sit here today with Mr. Hunter and my joint teammates, and look forward to answering your questions.

[The prepared statement of Mr. Hunter and Lt. Gen. Moore can be found in the Appendix on page 43.]

Mr. WITTMAN. Lt. Gen. Moore, thank you.

Mr. Guertin, you are now recognized.

STATEMENT OF NICKOLAS H. GUERTIN, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION, DEPARTMENT OF THE NAVY

Mr. GUERTIN. Chairman Wittman, Ranking Member Norcross, and distinguished members of the committee, thank you for the opportunity to appear before you today and for Congress's support as we discuss the Department of Navy's tactical aviation and munitions programs.

The FY 2025 budget request supports national security by providing for the procurement of 53 fixed-wing aircraft for the Department of Navy, which includes 13 F-35Bs, 13 F-35Cs, and 27 multi-engine training aircraft. This budget also supports the start of the MQ-25 low rate initial production and procures three MQ-25 Sting Rays.

The budget request continues to support the modernization and sustainment of legacy and fourth generation multi-mission aircraft. In March 17, F/A-18 E/F Block 3 production aircraft were placed on contract with Boeing. This contract also acquired technical data necessary for operational readiness and post-production sustainment.

In addition, this budget supports life cycle modernization initiatives and capability upgrades that enhance our inventory while maintaining tactical relevance. We continue to focus on stabilizing and strengthening the industrial base and managing supply chains. We seek to invest $227 million to increase production capacity and strengthen suppliers.

The Navy continues to take full advantage of authorities granted by Congress in the FY 2023 NDAA that provides streamlined, multi-year procurement processes for tactical munitions.

Not only has this authority allowed the Department to replenish munition stockpiles, which have been used in support of conflicts in Ukraine, Israel, and the Red Sea, it stabilizes the demand signal to industrial base, resulting in an increased capacity to develop, upgrade, produce, and field munitions at scale.

The FY 2025 budget continues to strategically shift the focus of the fifth generation fighter production with the acquisition of 175 F-35s across the FYDP [Future Years Defense Program].

As the service acquisition executive for joint strike fighter program, I will work closely with U.S. services, OSD [Office of the Secretary of Defense], and the Joint Program Office and industry partners to continue reducing program costs and ensure the sustainment strategies is implemented that meets the needs of the fleet and the entire F-35 enterprise.

The FY 2025 budget submission continues to invest in our airwing of the future, to include next generation air dominance and collaborative combat aircraft, which allow the Navy and Marine Corps to achieve service goals for investment in a future force and to maintain a competitive edge.

Overall, this budget represents the deliberate and informed development of a modernized, integrated, all-domain naval force for the fight today, tomorrow, and in the future, a fight that requires us to be agile, think differently, and prioritize wisely to meet an ever-changing and complex security environment.

Thank you once again for the opportunity to be here before your subcommittee today, and I look forward to your questions.

[The prepared statement of Mr. Guertin, Admiral Donnelly, and LtGen Gering can be found in the Appendix on page 66.]

Mr. WITTMAN. Thank you, Mr. Guertin.

Rear Admiral Donnelly.

STATEMENT OF RADM MICHAEL DONNELLY, DIRECTOR, AIR WARFARE DIVISION, DEPARTMENT OF THE NAVY

Admiral DONNELLY. Chairman Wittman, Ranking Member Norcross, and distinguished members of the subcommittee, thank you for the opportunity to appear here today.

Naval aviation appreciates the committee's support with recent procurement of new strike fighters and weapons and NDAA language that improves the ability and more effectively get at the capabilities and the capacities that we need for these systems and programs.

The criticality of our work is on display in the Red Sea with operations of Carrier Airwing 3 in Eisenhower Strike Group to maintain global sea control and access in support of our national interest and open access to vital sea routes.

Concurrently, the western Pacific deployment of Theodore Roosevelt and permanently forward-deployed posture of Ronald Reagan strike groups demonstrates the deterrence value of unambiguous credible forward presence and underscore our requirement to maintain an even more intense focus on sharpening naval aviation's role and the critical capabilities of our carrier strike groups in joint

warfighting integration as fundamental to providing combatant commanders options and what we will be required to fight and win decisively in any high-end fight.

Navy maintains our focused vision on airwing of the future, while higher donned budgetary priorities, deferred procurement of F-35C, Navy is continuing and committed to the F-35C carrier airwing transition plan.

Success F-35 carrier strike group deployments with VFA-147, VFA-94, and the Marine Corps' VMFA-314 inform Navy's process of learning in order to better qualify costs, mission-capable rates, and operations of the F-35.

Future platforms of airwing of the future will further improve persistence and increase operational reach and capacity through the combination of its 6th Generation platform F/A-XX, advanced long-range weapons, and unmanned tactical platforms that support carrier wing ability to pace the most stressing threats through the 2030s and beyond, keeping nuclear-powered aircraft carriers as the most viable option for deterrence in crisis response around the globe.

We continue to develop methods of achieving high-end training through live virtual constructive training and via joint simulation environment and our integrated training facilities that enable air crews to conduct joint, enable integrated end-to-end enhanced mission training in simulated environments, mitigating the requirement to continually expand our live training ranges.

In addition to aviation platforms, PB-25 [President's Budget 2025] weapons procurement plan is focused on inventory objectives of priority and critical munitions through multi-year procurement and large-lot production contract awards for maximized rate and reduced all up around costs.

Navy thanks Congress and this subcommittee for your continued support of important aviation priorities, including our flight hour program, critical aircraft upgrades, and investment in future capabilities, and I look forward to answering your questions.

[The prepared statement of Mr. Guertin, Admiral Donnelly, and LtGen Gering can be found in the Appendix on page 66.]

Mr. WITTMAN. Rear Admiral Donnelly, thank you.

We will now go to Lt. Gen. Gering.

STATEMENT OF LTGEN BRADFORD J. GERING, DEPUTY COMMANDANT FOR AVIATION, DEPARTMENT OF THE MARINES

General GERING. Chairman Wittman, Ranking Member Norcross, distinguished members, thank you for the opportunity to appear before you to report the state of marine aviation. Your support has been critical in our ability to maintain a warfighting edge in the face of a rapidly changing global landscape and emerging challenges.

As directed by the commandant, we are balancing the sustainment and upgrades of current capabilities to meet our enduring crisis response requirements while executing deliberate force modernization across all functions of marine aviation.

I want to thank Congress and this subcommittee for your continued support in funding our critical sustainment accounts, which en-

able marine aviation to generate the capabilities and warfighting readiness required to meet our global crisis response mandate.

This support enabled our newest F-35B squadron, Marine Fighter Attack Squadron 542, to deploy to the high north as part of Exercise Nordic Response, where they executed sustained operations with allies and partners and achieved 100% sortie completion rate.

The Marine Corps F-35 program of record remains 420 aircraft, and we are continuing to transition to an all 5th Generation tac [tactical] Air Force. Your corps currently eight operational F-35 squadrons ready to respond to crisis worldwide, and we will hit the halfway point in our transition to 18 active component squadrons by the end of this calendar year.

We are working closely with the Joint Program Office and other services to ensure vital weapons capabilities are delivered to the fleet on an acceptable timeline and without unacceptable cost growth. We appreciate the continued congressional oversight and support on TR-3 and Block 4 modernization.

We are aligned with the Air Force and the Navy in prioritizing the engine corps upgrade and power and thermal management systems upgrade to meet future capability enhancements and reduce future sustainment costs.

As we look for continued opportunities to enhance our current 5th Generation capabilities, Marine Aviation will execute a deliberate modernization effort we call Project Eagle. Project Eagle is Marine Aviation's fully informed modernization strategy spanning three future year defense program cycles out to the year 2040.

One such effort includes accelerating the prototype in an experimentation of tac air collaborative combat aircraft and building a common interoperable control architecture for integrating with joint assets. The Marine Corps has taken the lead on integrating and testing the XQ-58 as a pathway toward a broader series of CCA capabilities in the future.

To date, the Marine Corps has completed two successful XQ-58 flights, and we are planning three additional flights this fiscal year.

In closing, central to Marine Aviation are your Marines, the men and women of Marine Aviation, the driving force behind our continued excellence. Their unwavering commitment, coupled with a penchant for innovation, ensures Marine Aviation remains agile, lethal, naval at its core, and contributed directly to deterring our adversaries.

Thank you once again, I look forward to your questions.

[The prepared statement of Mr. Guertin, Admiral Donnelly, and LtGen Gering can be found in the Appendix on page 66.]

Mr. WITTMAN. Lt. Gen. Gering, thank you.

Lt. Gen. Schmidt, you are now recognized.

STATEMENT OF LT GEN MICHAEL J. SCHMIDT, PROGRAM EXECUTIVE OFFICER AND DIRECTOR FOR THE F-35 LIGHTNING II PROGRAM, DEPARTMENT OF THE AIR FORCE

General MICHAEL SCHMIDT. Chairman Wittman, Ranking Member Norcross, and distinguished members of the subcommittee, thank you for the opportunity to provide an F-35 program update.

In December, I testified before this subcommittee on top expanding F-35 development, production, and sustainment. The subcommittee highlighted priorities, including engine modernization, test infrastructure enhancements, digital engineering initiatives, supply chain maturity, future sustainment strategy, Tech Refresh 3 resolution, and Block 4 delivery.

As you know, development and production concurrency is Block 4's most critical challenge, and we are dealing with its consequences today. Since my last testimony, the F-35 Joint Program Office has maintained an unequivocal focus on these efforts as we work to make congressional and warfighter expectations a reality.

I look forward to offering updates regarding progress across these fronts and to sharing details on the work that remains.

Amid these efforts, the Department of Defense's official declaration of Milestone C and formal full rate production decision in March 2024 gives credence to the acquisition maturity taking place within the F-35 enterprise. For over 20 years, F-35 stakeholders have laid the groundwork for a 5th Generation air system that is operating around the world today and planned for employment by U.S. and international users for decades to come.

With this milestone behind us, we enter a new chapter as we make an unrelenting push to modernize this platform for the future and drive sustainment excellence throughout the fleet.

TR-3 [technology refresh 3], a reimagined Block 4, propulsion modernization, and upgrades that will follow depend on the work we must execute today. The F-35 program represents professional acquisition at its highest level, and I am tremendously proud of the team working to bring these objectives to life.

As this subcommittee knows, the efforts that got us here will not be sufficient to get us where we are going. Success will continue to require the best personnel, software practices, facilities, supply chains, and industrial partnerships our U.S. and international teammates can offer.

I have no doubt we will continue to face and overcome complex challenges, and I assure you the F-35 Joint Program Office team remains up to the challenge. Thank you.

[The prepared statement of Lt Gen Schmidt can be found in the Appendix on page 93.]

Mr. WITTMAN. Lt. Gen. Schmidt, thank you so much.

Dr. Schmidt, you are next.

STATEMENT OF DR. DOUGLAS SCHMIDT, DIRECTOR, OPERATIONAL TEST AND EVALUATION OF THE OFFICE OF THE SECRETARY OF DEFENSE

Dr. DOUGLAS SCHMIDT. Chairman Wittman, Ranking Member Norcross, distinguished members of the subcommittee, it is an honor to be here today to provide a summary of the results and recommendations on tactical fighter aircraft and related programs that are under my oversight.

I would like to focus my opening comments on three areas: the combined report on the F-35 integrated operational test and evaluation, or IOT&E, and live-fire test and evaluation, LFT&E; key findings across other programs; and the operational test infrastruc-

ture needed to support testing of current and emerging tactical weapon systems.

DOT&E [Director Operational Testing and Evaluation] released its combined F-35 IOT&E and LFT&E report in February of 2024, and in March, DOT&E staff briefed these results to this subcommittee. My staff is available to provide follow-on briefings at your convenience.

Next, I will move on to key findings of other tactical fighter aircraft and tactical fighter aircraft-related programs. The first is the F-15 Eagle passive-active warning and survivability system, or EPAWSS. The current electronic warfare test infrastructure significantly limited the breadth of DOT&E's assessment of EPAWSS effectiveness during its recent IOT&E.

This limitation affects all spectrum warfare systems, especially electromagnetic attack systems like EPAWSS and the EA-18 Growler next gen jammer. DoD's open and closed hardened loop laboratories and military test ranges need upgrades to address these and other limitations.

The next key finding comes from the F-22 and F-35 programs. These programs have ongoing test instrumentation challenges that center around the integration of the open-air battle shaping, or OABS. OABS was utilized in F-22, F-35, and F-15 EX operational testing.

It enables high fidelity live testing with real-time kill removal and data collection. It is already installed in several CONUS [Continental United States] ranges and continues to expand.

Multiple Air Force, Navy, and Marine Corps aircraft are already equipped with OABS, which requires frequent upgrades to keep up with the platform and weapon program upgrade processes.

High-fidelity data collected by the OABS system is essential to the verification, validation, and accreditation of modeling simulation on different platforms and integrated -- that they are integrated into, and continually see upgraded in the joint simulation environment, or JSE.

As findings from these tests show, the operational test infrastructure needed to support modern testing continues to be a challenge. The JSE is a high fidelity battle space environment, and it is currently integrated with the F-35-in-a-Box software, blue and red cockpits, and advanced surface and air threats that were required to support F-35 IOT&E.

The JSE is rapidly expanding to support the multiple platform test and evaluation tactics development and high-end training for aircraft, such as the F-22 and F-18.

In addition to the JSE, there is also other needs we have for stakeholders, which include support for digital class-of-threat emulators that are also integrated with the OABS for realistic real-time integration with threats.

It is important that we get these systems and other systems into critical platforms like the F-22 and F-35, and we would be partnering with the Test Resource Management Center in order to do this.

Thank you for your attention, and for your continuous support of our service men and women, and I look forward to your questions.

[The prepared statement of Dr. Douglas Schmidt can be found in the Appendix on page 120.]

Mr. WITTMAN. Dr. Schmidt, thank you.

We are going to go to our committee members now to begin the questioning.

Mr. Bacon.

Mr. BACON. Thank you. Thank you, gentlemen, for being here. We appreciate your leadership.

I submit to you that we don't have a large enough top line for this year. It is a one percent growth in spending, underneath inflation, and because of that, you are forced to make some, I would say some bad choices.

So just look at some of the numbers. In 2024, we are going to bring in -- and this is really more to Gen. Moore for the Air Force, but I think it is true for all the services to some degree, we are going to put in 60 new aircraft, but we are going to get rid of 190. So that is 130 subtractions there of fighter aircraft.

And over the next five years, you will bring in 351 fighters and get rid of 594. And that is going to be a loss of 243 fighters. So that is almost like ten fighter squadrons' equivalent. I know in 2019 we said we needed seven more fighter squadrons, and now we are budgeting a loss of about ten more. We are going backwards.

So my question may be to Gen. Moore, and the backdrop is we are spending about 3.1% of our GDP [gross domestic product] on defense, it used to be around 4. So I think we are at historic, not the historical low, but near the historical low for spending.

So, would it be true, Gen. Moore, to say that the top line is forcing us to make some bad decisions? If we had a higher top line, would we produce some more fighters or get rid of less?

General MOORE. Sir, I would say that in order to comply with the Fiscal Responsibility Act, we did make choices that you can see very clearly in our budget.

Mr. BACON. Are we going the right way to address a near-peer competitor fight?

General MOORE. Sir, I think the capabilities that a near-competitor brings require aggressive modernization. And the questions is how do you get there.

Do you aggressively modernize by shedding old capability? Do you aggressively modernize by a higher top line? Or do you aggressively modernize by taking money out of readiness? There aren't really many other choices.

Mr. BACON. Well, with a higher top line, we could produce more F-35s?

General MOORE. We intended to buy six F-35s this year, as well as six F-15 EXs. You can see those in last year's FYDP. But they are not still in the budget year.

Mr. BACON. I am just concerned that we are going to be 17 fighter squadrons short for what we need, and we are not going the right direction. I am not blaming this team, because I think it is a result of decisions made by Congress and the President. But I think we are not going the right way to meet China.

And with that, I will yield.

Mr. WITTMAN. Thank you, Mr. Bacon. I think those are all very salient points as far as where we are going with scale.

Listen, we understand the need to modernize. The key is, is you know, we always go through these transitions where we get rid of existing platforms regardless of their limitations and capabilities and things that they can and cannot do for the promise of new capabilities somewhere out in the future.

And I tell folks, all of our dreams come true outside the FYDP. So you have this giant gap, and all of a sudden, you figure well, we are going to save money to get there. The problem is, is your leaders that follow on say well, wait a minute, we are going to use this money for other purposes.

So it always is a disconnect there. We have got to find a way to get those curves to intersect as far as retiring older capability, bringing online new capability. It always seems like there is a bathtub there we have to swim in for years, so.

All right, and with that, Mr. Courtney, you are recognized.

Mr. COURTNEY. Thank you, Mr. Chairman. Thank you to all the witnesses for your conciseness and efficiency in your remarks, which were also very full of content.

Lt. Gen. Schmidt, last December you mentioned, you know, you testified here, and at that time you discussed that 80 kilowatts of cooling capacity is the objective requirement for the Joint Program Office as part of the engine and power thermal management modernization program, you know, was the requirement.

Is that objective requirement of 80 kilowatts still the margin that you need for future requirements?

General MICHAEL SCHMIDT. Yes, sir, the requirement is actually -- the window is 62-80, but the threshold is 62 and 80 is the objective.

Mr. COURTNEY. And what is the acquisition strategy for a new power thermal management system, and what do you estimate is the timeline to deliver to the fleet?

General MICHAEL SCHMIDT. So, sir, we are just getting started on the power and thermal management piece of that, because it was an FY 2024 new start. So we will -- I will be able to fully answer I think that question next year.

With that initial 2024 new start and getting Lockheed to fully characterize the airplane and what all of the boundary conditions are for a power and thermal management system will be better defined.

As far as the engine core upgrade program, which we really embarked on to get the life back into the engine, that is proceeding nominally. And I am looking forward to this year to really inform the 62-80 requirement.

Another important requirement is the retrofitability of this. So that is a requirement from all of our customers that we can affordably retrofit the airplanes that we have out there. And that will -- that is all playing into the design considerations.

Mr. COURTNEY. So the budget request regarding engine core upgrade was $527 million. I mean, is that, you are confident that is the right number in terms of just how the process is moving at this point?

General MICHAEL SCHMIDT. Sir, I am confident in that number today. So we have a requirement from Congress, and I actually ap-

preciate it, to come back and make the engine modernization program a separate subprogram, managed separately.

We will, again, the engine core upgrade program is kind of going through its risk reduction phase. Power and thermal management work is just getting going.

We are going back to the department, and we will lay all this out for Dr. LaPlante that the DAE [Defense Acquisition Executives] as well as the service acquisition executives as we create that subprogram. And we will have to do an independent cost estimate on that. But for right now, sir, I am confident in the funding that is in the budget, yes, sir.

Mr. COURTNEY. Great, thank you.

General Gering, the Marine Corps' FY 2025 unfunded priority list contains a request of $97 million for additional F-35C engine spares and power modules. Can you discuss how important the spares are to the F-35 program and how prioritizing depot outputs sustains flight operations for the aircraft?

General GERING. Sir, thanks for that question. Yeah, what we have experienced since purchasing sovereign spares is really what it does for our readiness, not only our home-based readiness, but also when we deploy.

It gives us the ability to put spares on ships as we deploy, and it is just more timely. So we have really benefitted quite a bit from that, sir, and we continue supporting that in the future.

Mr. COURTNEY. Right. And as you are sort of ramping up in the Indo-Pacific region, I would imagine that that tyranny of distance makes that even more useful.

General GERING. Yes, sir, tyranny of time, distance, logistics only gets harder in INDOPACOM [U.S. Indo-Pacific Command], sir.

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

General GERING. Thank you, sir.

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

Dr. MCCORMICK. Thank you, Mr. Chair.

I will get right to the point, because I know we have limited time and we have votes coming up. Real Admiral Donnelly, I recently was on a plane trip and I was watching a documentary for about the fifth time, you have probably heard of it, called Top Gun: Maverick.

I had some concerns, because I am from the 1986 graduation class, so I am the Top Gun class, and I don't understand why a guy named Tom Cruise gets a cat & trap ride and I don't. I have significant concerns. Is that because of the discrimination because my wings move when I fly, or some other reason?

Admiral DONNELLY. I appreciate your question, sir, and I look forward to rectifying that issue as quickly as possible.

Dr. MCCORMICK. Outstanding answer, you have my full support in whatever you want.

With that said, shifting gears a little bit, Lt. Gen. Schmidt, I know recently there was testimony in Congress that there was lab testing that has greatly benefitted our models looking into the future. And I know we have done this with the Osprey where we have avoided a lot of problems. But of course now we are having some hard problems facing us.

But as we look forward, is the software test capability a limiting factor in the delivery weapons systems capabilities as far as that bottleneck of what we are seeing kind of slow down the process? How do we widen that bottleneck to progress to where we need to be to continue to force through our innovations and our advancements?

General MICHAEL SCHMIDT. Sir, thank you for the question. So, absolutely that bottleneck is restricting our ability to deliver everything we want in this program. In fact, we are considering truncating the current 40 -- the current software for the TR-3 deliveries so that we can get after the next version of software to deliver the full combat capability.

And they are competing with each other in the labs. And there's many other reasons that we are trying to do that as well. But that is a challenge for us, the lab capacity.

At the same time, we had a great software architecture independent review team come in, and they laid out a number of long-term priorities as well as short-term priorities in terms of our digital infrastructure model-sharing and things like that. I am excited, we are rallying with our industry teams to prioritize those things. In fact, they did that just last week.

And we will be pushing forward some of those I think we can vest within the program. Others we will have to discuss whether industry pays for them or the government outside the program. But thank you for the question. Yes, that is a challenge, sir.

Dr. MCCORMICK. Absolutely. And in a related question, I don't know if this would be for the Honorable Mr. Hunter or not, but do we feel like we had the right competition, this kind of relates what you were taking, these models that are competing with each other for the next advancements?

Obviously we are always short on money. We want to have a competition that drives down the price range, and at the same time increases the quality. Do you think that is a working, functional model right now, or do you think that there is something that is hamstringing us in our advancements in that category?

Mr. HUNTER. I think we have proven that we can do it and that it can work. And we have also proven that we can do it affordably. But that obviously ties in a bit to the nature of the capability that you are trying to acquire.

So with a collaborative combat aircraft I would point to where we have a number of vendors currently working, early stage design work, which we are able to afford having multiple doing that work.

Then as we progress to more concrete, you know, build and the expensive activities, that does neck down. But we get very robust competition early on, which allows us to choose our vendors based on their actual demonstrated capability, not just a paper product or advertisement.

And that is core to our strategy of beginning CCA Increment 2, is for those who do not get selected to continue on Increment 1. They can continue to work bettering the capabilities for future program offerings.

Dr. MCCORMICK. Good, I hope that continues to be a competitive process. I know there's always these legacy programs, and sometimes we get stuck in these funnels of money which kind of give

us less opportunities, less competition, which of course costs us more money and more problems in the future as we progress.

Specifically I don't know if this would be for Gen. Schmidt or somebody else, but what lessons learned are you documenting from the power thermal management system, the PTMS, and the engine issues on the F-35 that will inform our future in development?

General MICHAEL SCHMIDT. That is a great question, sir. I think the biggest lesson learned is develop whatever products you have that meets the spec in the first place. And in this case, we had an engine that didn't meet the specs.

Now, at the same time, the engine had already been designed as the aircraft was being built, so I am not trying to point fingers here. It is just, that is a challenge. As the requirements grew on the airplane, the engine was already designed.

And so yeah, eat into the life of the engine and all that kind of stuff. I am, you know, I think there are some really innovative things going on in terms of the engine core upgrade, which will allow us to get the life back into this engine without changing our complete supply support infrastructure and make it as common as possible.

But ultimately if the specs aren't matching in the first place, the integrated design documents don't match each other, then you are probably going to have a problem.

Dr. MCCORMICK. Excellent point for future planning for our future development in R&D [research and development]. And I will say, gentlemen, again, I want to reinforce that Admiral Donnelly gave the best answer for the day. Thank you.

Mr. WITTMAN. Thank you, Dr. McCormick, appreciate it.

Mr. Carbajal, you are now recognized for five minutes.

Mr. CARBAJAL. Thank you, Mr. Chair. I think we have a record number of witnesses today, more than some subcommittee members, so thank you for being here.

Gen. Schmidt, it is well known that the F-35 program has had significant overrun costs in its schedule. This has been a big bill for the taxpayers to pick up. Certainly we have gained great capabilities with the F-35, but quite frankly it has been an embarrassment when it comes to the price tag that has crept up significantly.

I hope throughout the life of this program the department has learned lessons to lower costs for future programs like next generation air dominance. Do you think the department has learned lessons to apply to future programs? What is the department actively doing to drive down costs for future programs?

General MICHAEL SCHMIDT. Sir, that is to me specifically on F-35. So as far as development goes, I would say we -- concurrency is our biggest challenge, and we bought into a rapid, agile acquisition process to deliver software. And really, we are delivering a lot of very hard-to-develop hardware as we integrate this, and integrating that hardware has been our biggest challenge.

And I think the failure of our teams to recognize the complexity of some of the things that we bought into in that schedule is part of that. And undoing that concurrency is a really important part of that, and I could talk to you a lot about reimagining Block 4, but I don't want to take up all the time. But I am sure we will get to that eventually here.

In terms of costs, I do want to -- so development costs, we certainly have gone in the wrong direction here in terms of delivering Block 4. In sustainment and in our operating costs, I am very proud of the team.

We have significantly reduced our cost per tail per year, significantly reduced our cost per flying hour. We have an active war on costs going on in the program. Just in the last year, in sustainment costs, again, through the life of the program, we have taken out $13 billion in costs in the program.

Our last cost estimate, in current year dollars, so factoring out inflation, is $45 billion less over the life of the program than the year before. So I am totally with you, sir, on development costs, and we got to get better at cost estimating and laying out our schedules. But I think we are making some progress on the sustainment side.

Mr. CARBAJAL. Great, thank you very much. I do hope that is codified so that in the future we do have those learned lessons to apply in the development side of this.

The Air Force goal is to have a tactical fighter fleet that provides the capability, capacity, and affordability to meet air superiority and the global strike needs by 2035/2040 timeframe.

Gen. Gering, Gen. Donnelly, and Gen. Moore, do you think this timeline is adequate for our national security? And do you think we will have capability gaps between now and then? Don't all jump in at once, please.

General MOORE. Sir, I think that if we want to ensure that we are able to confront a peer adversary, we are seeing capability gaps developing long before the timeframe that you mentioned. And so I think if we want to make sure that doesn't happen, we have to aggressively modernize.

I mentioned before there are basically three ways to do that. You can modernize at the expense of readiness, you can modernize with a higher top line, or you can modernize at the expense of the other foundational things that need to occur.

So I think we can look into the future and see that if we want to remain relevant into the early to mid 30s, we have a challenge now, and it requires aggressive action.

Mr. CARBAJAL. Gen. Donnelly or Gen. Moore?

Admiral DONNELLY. Thank you, sir, I think CNO [Chief of Naval Operations] Franchetti has been very clear in the decade of concern, it has come upon us. And Navy is very focused on current capability and program wholeness.

And we see that in our service life modifications of our current F-18 fleet, bringing them to a Block 3 capability, as well as the procurement of those new aircraft that are arriving to our flight lines. And also as we have our airwing transition ongoing.

So we recognize in the role that we have to play in global presence today, we have to be ready for the fight tonight in any circumstances, whether it is what we have ongoing right now in the Red Sea and the role that we are playing over there, or against a high-end adversary.

So we recognize the point that you made, yes, sir.

Mr. CARBAJAL. Thank you. I am pretty much out of time, Mr. Chair. I yield back.

Mr. WITTMAN. Thank you, Mr. Carbajal. We are now going to go to Mr. Norcross.

Mr. NORCROSS. Thank you, Chairman. And thank all the witnesses, which you officially do outnumber us up here.

Obviously we are dealing with a number of issues. And when we talk about some of the priorities, F-35, largest program ever in history of DoD [Department of Defense].

So when we talk about delivering the TR-3 aircraft, let me start by asking, there is a pause on delivery, Gen. Schmidt. How many aircraft are parked on the tarmac somewhere in this world, waiting delivery to us?

General MICHAEL SCHMIDT. Sir, can I just say a significant number? I would rather not advertise that to all of our adversaries. But a significant number, sir.

Mr. NORCROSS. And I think that is agreed upon, both Lockheed Martin and all the people sitting here today. And when we look at those, we have been in this meeting, going back year after year talking about this, and each time we are kicking the can down the road. It is always something new.

You need to understand the frustration. I know Chairman feels this strongly, and he will speak about it, but the date for delivery of TR-3, how confident are you that it actually will meet that modified date that we have now?

General MICHAEL SCHMIDT. Sir, as I said in my last testimony, I am as frustrated as you that I can't nail down a specific date and be extremely clear about exactly when we will deliver. That said, the best chance we have to get to a truncated, so a couple of combat capabilities will be in there, the first realistic chance is July of this summer.

And that would basically be the current version of software or maybe with a little tweaks, because it takes a while to get through airworthiness and all that, July. The software architecture independent review team that just finished, they estimated more like August or September of this year.

So and I, there are some awfully smart guys on that team, and we could talk a lot about all the things that they found. But the frustration that you have, that I have with our lack of ability to say exactly where we are is driven by hardware immaturity that we are doing a lot of software work-arounds to, you know, to deliver as efficiently as possible.

And that is not a long-term winning solution. And I think this all goes back to the concurrency of us saying, you know what, no matter what, this hardware needs to be in this slot. And yes, I understand why we make those decisions.

At the same time, putting our national asset production lines at risk for a development program, there are other options to deal with concurrency, and we need to do a better job of that. And when we reimagine Block 4, we are going to change that model for sure.

Mr. NORCROSS. Thank you. You talked about Block 4 and lessons that we have learned. What else can we do to, I will use the term enforce, cajole, plea, to get this in a time that is relevant to us? There are a number of target dates that we have heard, that potentially could be an issue in the South Pacific.

But regardless of those, 27, 28, 29. Now more than ever, what can we do differently? Authorities, a piece of legislation in the NDAA, what can we do to collectively push our foot down a little harder to make sure we hit these in a time that is relevant to us?

General MICHAEL SCHMIDT. Sir, last year you invested in additional flight sciences jets for this program. That was very, very important. We all should have done that years ago, but, and that is not going to help us out next year. It will help us out in a few years from now.

Similarly, in the situation we are in, as our discussion about lab investments, I also, my frustration over our lack of digital infrastructure and whether that is our industry, because it is our industry not making the investments they need to make. And of course the government has a role in that to some degree.

But if we are going to be the most advanced, out front, biggest airplane fighter program in the world, we should have a digital infrastructure that looks like we are the biggest fighter program in the world. And we don't have that now, sir. And whether you want to hold me to that or industry, we both are accountable for that, and we need to have that infrastructure out there.

Mr. NORCROSS. So I will just wrap up. Pointing fingers, we do, doing that. And this isn't to beat up on the contractor per se. Obviously we all have skin in the game. But the idea of the F-35 is a remarkable aircraft by any measurement. But who we are going to be fighting against potentially have even more remarkable.

So we can say hey, we got a great one. But if we can't beat it, it become irrelevant. I know I will have more questions, but let me toss it back over to Chairman.

I yield back.

Mr. WITTMAN. Thank you, Mr. Norcross.

Gentleman, we have seven votes on the House floor right now. The first vote has come to time, and we still have time to get down and vote. So I would ask, if you would, to stay here with us. We are probably going to be 45 minutes to 55 minutes in votes.

So if you could stay with us, we would like to come back and continue the line of questioning, if that suffices with your schedule. Unfortunately, these vote series are somewhat unpredictable for us. So we would be very honored if you would stay with us while we have a chance to go vote.

With that, we will recess until after votes. Thank you.

[Recess.]

Mr. WITTMAN. We are back and we appreciate your indulgence and being patient with us. And we will get back underway.

So Don, I will let pick up your questioning, and we will go from there.

Mr. NORCROSS. Thank you, Chairman. Certainly, again, for sticking in there with us, we really appreciate it.

When we start talking about capabilities, capacities, and the statement that I alluded to during my opening remarks, capacity is important but capabilities. Mr. Bacon talked about the retirement issue across the board. And when we look at those, the numbers are significant, the replacement numbers.

So as a first question, when we start looking at what a CCA is going to be, how are we going to compare when CCAs enter oper-

ation when we start talking airframes? Gen. Moore, can you give us some light on where we might be going? The CCA versus a manned platform.

General MOORE. So I think we would probably be ill-advised to compare CCAs to manned platforms. CCAs are intended to be something different. They are intended to be able to augment what manned platforms are able to do but not to replace them.

So I don't know that we would want to draw necessarily a direct correlation between the tail, the number of tails or the number of nosewheels or whatever it is that you would like to count. I think there is an issue of capability. There is also an issue of capacity.

And I think what we would like to look at is what capacity are CCAs able to add to a package that we would send forward and how does it impact the average cost per tail of that package in order to deliver effects.

So I am not trying to duck the question, I am not trying to use a bunch of words to get out from under it, but the fact of the matter is I don't know that there is a direct correlation and I don't think we should draw one. I think we should look at combat power. And I think that is how we ought to make that comparison.

Mr. HUNTER. If I could, Congressman, one of the insights from our operational imperative work that I referenced in my opening is the complexity of the mission threads that we have to execute in a high intensity peer conflict. And they are complex enough that no individual platform can succeed without the contributions of the other platforms and the networks that support them all.

And therefore, again, in addition to what Gen. Moore said about its being hard to compare a CCA to a manned fighter platform, in terms of delivering the capability that you care about, success in our missions, the individual platforms aren't the best measure of how -- of our ability to do that.

Mr. NORCROSS. I couldn't agree more. But that is how we are being measured in comments that we have around here. And somehow that they are the same, and they are not. It is the capabilities, but by the same token, if you lose one that has high capabilities, then you are losing a lot more than that one.

But I think it is incredibly important to have that deeper conversation rather than just tails. But tails do count. And that is where I want to go to.

When we start looking at some of the retirement plans, and I have been supportive generally of the plans that have come before us over the past, quite frankly, ten years. But when I see some of the retirements this year, given some of the reports of what happened on Saturday, the F-15E and what they were able, yet they are on the list to some degree.

Gen. Moore, can you talk to us a little bit that? As relevant as it was on Saturday, how do they become irrelevant and retire in short order?

General MOORE. Yes, sir, so it is a fair question. First of all, we don't seek to retire all of these, only the oldest of them. The ones that we are talking about average 33 years old.

They are older, in fact, than our average fleet age, which is about 29 and a half, and 29 and a half in our opinion is far too old a fleet for us to consider perpetuating that cycle.

The other thing is F-15Es don't operate by themselves, they operate as part of a network. It is the air crew, it is the munitions, it is the command and control. The other thing is this weekend, I don't want to take one single thing away from what happened this weekend, but there was neither a surface-to-air nor an air-to-air threat.

They did not penetrate the highly contested environment, they didn't penetrate into an A2/AD [anti-access/area denial] environment. I don't mean to take a single thing away from the great work that they did. Take that same set of -- that same set of things that surround the platform and transition that to China, and I think you find a very different result.

And so what we are trying to do is build the capability that it takes to confront a peer adversary. Iran is not a peer adversary.

Mr. NORCROSS. Right. If we are going. But it is the truck that is behind you that is carrying all the luggage that can --

General MOORE. Yes, sir.

Mr. NORCROSS. Be fired from elsewhere.

General MOORE. Yes, sir.

Mr. NORCROSS. So very much still in there, so appreciate.

I want to switch over to the Marines a little bit. Last year the Marine Corps talked about the outfit of the squadrons as ten aircraft, and we went into great detail why and so on. Yet this year, it appears to reverse that decision, going back to 12.

General, can you share with us what analysis? Was last year wrong, or what came in that you were able to see this year that made you change that number?

General GERING. Sir, thanks for that question. Yeah, there are really two things that informed our decision to go from 10 to 12 aircraft across all 18 active component squadrons and two reserve component squadrons. And it really came down to, first of all, informed by the operating environment and the anticipated threat.

And then when we look at unitive employment or formation required to either counter that threat or prevail on that threat, and then couple that with sortie generation rate, how many times do you want to be able to do that each day, the number 12 makes a lot more sense when you look at the way that we employ the aircraft.

So that was really informed by two things. The first was extensive exercising out in the fleet. I had the privilege to command 3rd Marine Aircraft Wing for two years. We had five fleet F-35 squadrons, 10 aircraft per squadron. And for two years, we exercised them extensively.

And that was one of the real big lessons learned, where if you really want to have the sortie generation rate and get the formations airborne that you need, that 10 did not necessarily work well. Or you would have to have a higher readiness rate than what we are planning for. Twelve works out really well for that.

The second piece was a third-party look by Johns Hopkins. They did a study and their findings basically supported what our findings were, sir. So the plan going forward is to go from 10 to 12 aircraft across the board.

Mr. NORCROSS. Well, I can appreciate the study, and quite frankly, at times it takes courage to say hey, we made a mistake, we

change it. Mistake is probably not the right word, but a reassessment of what you did. And the idea of looking at it is something that we appreciate that conversation with.

I was going to have a conversation regarding the IOT&E, but for reasons that we were informed, we are not going to be able to go there, at least in this public session. But we will have to get with your staffs, later on, Dr. Schmidt, to address those questions, given --

Dr. DOUGLAS SCHMIDT. Absolutely, Ranking Member.

Mr. NORCROSS. What happened. I yield back.

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

Mr. FALLON. Thank you, Mr. Chairman.

You know, when I was junior officer in the Air Force, I remember them always teaching us about not only air superiority, but air supremacy. Like, we own the skies. And then I went off to live my life after I left and served in the state legislature for eight years. We don't talk a lot about air superiority in the Texas Legislature.

So when I got here three years ago, I was a bit surprised that that is something that we don't -- we can't guarantee any longer because of technology, because of drones and things of that nature. Then when we see what happened in Ukraine and that use, what I wanted to talk about is in the future, how do we combat that problem?

We just saw roughly 300 drones not reach their targets. Yay, that was wonderful that no civilians were killed, but at what cost? And I don't think Iran's 300 drones cost nearly as much as, and you can see where I am getting at, the attrition. If there is some non-state actor that were to do that where we couldn't hit back.

I mean, one of the things that we will see about Iran not doing it again is then they are going to get hit by Israel hard. But if it is a non-state actor, I am worried about the attrition factor.

And when I met with -- when we met, Chairman, with like Palmer Lucky and what is it, Anduril, and they are doing things differently and cost effectively. So I wanted to just kick, there are some very smart people on this panel, and ask how are we going to address that moving forward.

Mr. HUNTER. Well, affordable mass is definitely a core principle of our collaborative combat aircraft program. Anduril happens to be one of the vendors competing on that program, along with others. And that competition I think is vital to the whole concept of affordability, getting the price where we need it to be to be able to purchase in the volume.

CCAs are going after a higher end threat than the, you know, than the drone threat that was recently made evident. So we have to have a range of capabilities, from things that can combat $10,000 drones to $300,000 drones to million-dollar drones and up to sophisticated fighter aircraft.

And it is finding that way to balance all the priorities within, I know for us in the Air Force, within the Air Force POM [Program Objective Memorandum], that is the major challenge of going through these budget exercises. And then we get to the end and we look and we see hey, we ended up with fewer fighter aircraft this year than had previously planned.

And a lot of it is driven by those requirements that continue to manifest as we go through our POM process, and we have to adjust our plans in response.

But affordable mass is definitely core part of the concept and something that we are changing the way we do acquisition to allow us to generate affordable mass capabilities in a way that our system has not been optimized for in the past.

Mr. FALLON. Anyone else care to comment? Okay. Also with the, you know, in previous hearings we talked about autonomous aircraft. And I think that would be invaluable if we were to have a hot war with China. And considering what is the result of the war games and the tremendous losses that we take in a very short period of time, not only in materiel but of course in human lives as well.

And the other advantage is you are not constrained by the limits of the human body in that you are just constrained by the laws of aerodynamics. And so what I wanted to ask Gen. Moore is can you elaborate more on the program and discuss the way ahead for autonomous air platforms?

General MOORE. Yes, sir. So we submitted as a part of our 2024 budget request Project Venom. It was approved. It is a way of taking an F-16 and using it to explore various autonomy algorithms to find out what it is that we are able to do with autonomy. How far has it come so far and where is it able to go from here.

So we are excited about what may be able to come out of that, and we share your sentiment on the strong addition to our presence that could be made autonomous aircraft. And we are looking at that and we just getting ready to put our secretary in an F-16 that has an autonomy algorithm in it so that he can see it firsthand.

And this I think will be a great enhancement to manned/unmanned teaming. The next step past that is the no requirement to team at all to be truly autonomous.

Mr. HUNTER. One thing I would just add to that is our autonomy government reference architecture, which is the technical underpinning for not just delivering an autonomous aircraft as a one-off, but continuously over time with competition from a whole range of autonomy providers, including in a lot of non-traditional defense companies who have significant capabilities and autonomy that we have been challenged to access in the past because of clearances and a whole variety of other issues.

So that autonomy government reference architecture allows us to unlock access to a much wider range of tech providers.

Mr. FALLON. Thank you. Just hope --

Mr. HUNTER. Our secretary chose to fly, we didn't inflict that on him.

Mr. FALLON. Just that we all need to have the courage to embrace innovation. We just have to considering the changing landscape.

Thank you, Mr. Chairman, thank you all.

Mr. WITTMAN. Mr. Fallon, thank you, thank you.

Gen. Schmidt, I wanted to begin with you. I know we have had a lot of conversations about F-35, TR-3. It was bitterly disappointing to myself and other committee members that we had to

learn of another shift to the right to Q3, not directly from the contractor, but from an earnings call that we had to read in the newspaper, which was pretty disconcerting.

I know that you have had to deal with, through your tenure there, challenges in communication and back and forth about production capability, performance of the aircraft. All those things I think have led us to the point where we are today.

Can you give us your perspective on how you see the path forward? Because F-35 is it, we are all in on this aircraft. It has to perform the capabilities that TR-3 brings to the table are necessary, and it has to occur at the speed of relevance. Delays there create risks for this country, create risks for the brave pilots that fly those aircraft.

So can you give us your perspective on where things are today in light of delays, in light of what I think is lots of shortcomings in how TR-3 has been tested and developed? And listen, I am not looking to place blame.

I think everybody is part of this. And listen, Congress has to be part of this as far as not just understanding what happened, but what the solution is going forward.

So I want to get your perspective on how do you see things going forward to make sure we get back to where we need to be. And how do we, I hate to use a Navy term, but I am going to use it, how we do have a all-hands-on-deck mentality?

General MICHAEL SCHMIDT. Yes, sir, thank you for the opportunity. So let me just quickly talk about production and sustainment.

So production. We have national asset production actually lines. So in Fort Worth, in Italy, and in Japan. And we cannot interrupt those production lines because they have to keep going to make use of what we have built, which is a treasure.

In sustainment, we got a lot of work to do. I got a lot of team working through on readiness, could talk about it for two hours if you want to. I am proud of what we have done. I see a light in the sustainment end of the tunnel.

So when I get frustrated, like you do, sir, it is most of the time in development. And I, you know, we have signed ourself up to pipe dreams in concurrent, with concurrent programs and a long set of capabilities for a lot of reasons that we decided, well, I have to have it so it will be done in this timeframe without the engineering rigor required to get those capabilities actually into the airplane. And all the things that go with that.

So as we reimagine Block 4, we have already implemented last year capability decision points for specific capabilities before we agree to put them into a lot. We have already made poor choices in some other parts of the program that I can't undo. But at the same time going forward, we are going through the capability decision point process.

We are taking what we have learned from the tech baseline review team, the software IRT [Innovative Readiness Team] team, and we are going to re-lay out Block 4 in a combat-relevant timeframe with, yes, a subset of capabilities of the Block 4 program, but those which give us the most bang for the buck.

And honestly, sir, I am getting tired of over-promising and under-delivering, and I need to change that narrative.

All that said, just saying it is going to take longer and is not going to be satisfying, and all the things we talked about earlier with a true digital infrastructure being a state-of-the-art program for literally the biggest fighter program in the world, it would be unacceptable to be anything else. But I don't feel like that is where we are today.

The discussions, honestly, from industry are all we can do in the future on future programs. There is no future program that is bigger than this program.

And so getting after the development side is the thing that bothers me the most every single day, and those the things that we are trying to do about it. But I need some help from industry, sir.

Mr. WITTMAN. Well, Lt. Gen. Schmidt, I appreciate that. And I think things are finally starting to move in the right direction. I appreciate your assertion that we have to have the best on your team there at the Joint Program Office.

I appreciate the conversation we had a few days ago to give Lockheed credit that they are saying we are going to make sure we bring subject matter experts across the enterprise.

Because there are other aspects of what Lockheed does that use digital twin technology, that use digital design, that use advanced methods to make sure that we develop systems at the speed of relevance to make sure you get information quickly into comparison computer models to make sure we make those software upgrades.

Those are things that have to happen. Lockheed has made the commitment to do that. So as much as we will criticize knowing about it in an earnings call, they have said hey, there is going to be a marshaling of resources there to make sure that it happens.

The key now is execution, make sure that those things get done. I think the desire is there, the key is is to be able to do that.

And Lockheed is committed to staying in touch with members of this committee on a twice a month basis. We want to make sure that happens so we stay up to date. The same too with your office to make sure we understand the things that are happening.

We have an obligation in this too to make sure we are part of the partnership on what the path is forward. I tell folks, you know, we can talk all about the ground that we have already plowed and talk about how we got here, but the key is is what are we going to do on the path forward.

So I appreciate your perspective to say hey, we have got a long ways to go and a short time to get there, and to steal the words of the immortal Jerry Reed, but I want to make sure that we are getting things done. And I appreciate your perspective to do that.

I do want to ask, too, the next step forward. So as begin to deliver these TR-3 configured aircraft, are you confident as to when they are delivered as to where they will be operationally? And will there be additional things that need to be done in the interim to actually get them to be in combat-coded?

Because the thought is is when they first come in, they may not be at a combat-coded status. It looks like to me it may take 12, 16 months to get them from the early stages of TR-3 to actually being able to fly within that combat configuration?

Admiral DONNELLY. Yes, sir. There are certain capabilities that will not be available in the truncated version of the TR-3 software. And you are probably right about the 12-16 month. We are looking at everything we can to try to figure out what can we move left in that.

But that is an accurate assessment, sir, that for a couple of the capabilities that our warfighters feel are required to be fully combat-capable, they will not be there at the truncation, sir.

Mr. WITTMAN. Very good. So we still have even a ways to go once the TR-3 software upgrade gets delivered.

Dr. Schmidt, I want to go to you because the DOT&E report that we received here had quite a few aspects that had members asking a lot of questions. One of the aspects of the testing regime are the test beds.

As was pointed out, they are old, they lack certain capabilities in order to be able to get information quickly from the test bed to the ground. Sometimes they are failures, too, and what happens there and you have to repeat a test over again. Again, not investing in that has shown itself here at this particular point.

So I didn't know if you had any notable concerns or recommendations for the F-35 program to ensure that we have the requisite number of modernized test beds, test beds that can function, as Lt. Gen. Schmidt talked about, in the digital realm in ways that digital twin technology can be utilized and where we learn at the speed of relevance.

And I do want to make sure I put out there a precursor, because I know in your confirmation hearing that Senator Warren had mentioned your connection there. I just want to make sure for the full sake of transparency to kind of reflect on that.

Because we are asking you questions now that F-35 program and Lockheed, so I just want to make sure so people understand where your limitations are. So if you can't go someplace, that you let us know and that we are transparent about it.

Dr. DOUGLAS SCHMIDT. Sure, thanks, Chairman Wittman. I think I can speak to this because it is a broader issue than F-35, the need for a joint simulation environment-like capability or improving that capability is crucial.

Mr. WITTMAN. Yes.

Dr. DOUGLAS SCHMIDT. But it is more than just having the digital assets. We also have to make sure that those assets are calibrated appropriately based on open-air exercises and being able to feed that back in a synergistic loop where the digital environments get more representative and higher fidelity, and we are able to then go back out into the open air ranges.

Because it is, unless we are going to fight all of our future wars in video games, we need to be able to do something that goes back out to the actual operational systems. So there is continued need for investment in that, and it is not just F-35.

There is also other platforms, like F-22, where need to make sure we have the appropriate capabilities for the things like the open-air battle shaping capability there so that they can be part of those exercises to get the accurate date for the live-fire environments.

Mr. WITTMAN. Yeah. Well, the JSE [Joint Simulation Environment] I think is critically important, and you mentioned that. Give

us your perspective, too, on how we have seen other models of JSE happen. And that is you have the aircraft in the air, you fly it through certain rigorous exercises, you gather the data off of that aircraft.

But you also want to be able to compare it to a static model to look at what is happening there to kind of run the data through that. So the whole idea that you have a comparable system on the ground that exactly replicates what you are flying in the air so you are able to learn at the speed of relevance.

And those things I think are going to be incredibly important for the APG-85 radar, for the electrical optical multi-dimensional sensor kits that are going to be put on those aircraft.

If you are going to integrate those and make sure that those are being put into the software of the aircraft at the speed of relevance and you understand what the limitations are and the things you have to make and changes to the software, it seems like to me that it is not just new test beds in the air, but it is also having a comparison component that is hardware on the ground that exactly replicates it.

Give us your perspective on how you see that realm.

Dr. DOUGLAS SCHMIDT. Sure, Chairman. A couple things come to mind first. We have to be able to model the hardware dimensions accurately. Sometimes we can do that statically, sometimes it has to be dynamic. But there is also the software dimensions.

Mr. WITTMAN. Yeah.

Dr. DOUGLAS SCHMIDT. And perhaps most importantly in a lot of these newer systems, the network capabilities, because a lot of these systems have to work together in concert with other assets in the air.

And being able to model that with sufficient fidelity is challenging and the investment in our infrastructure is crucial and getting the right people who know how to build the models, who know how to analyze the models, who know how to interpret the results and then feed them back into the operational part of the system is crucial.

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

Lt. Gen. Schmidt, I wanted to talk a little bit now in a different part of the airplane. And that is in the engine itself. As we know, we are faced with making sure we get life out of the future engine. So the F-135 has its limitations.

A part of that is really looking at the entire system of the aircraft. So it is looking at how do we manage the wear on the engine by the amount of heat that is in the engine. The whole concept of bleed air. But more specifically, the power thermal management system.

Give us your perspective, too, on where you are in looking at that as we go down the road in making the evaluation of all those elements.

Because you can't discuss an engine upgrade without discussing PTMS and the other aspects of operations of the aircraft. So give us an idea about where you are in that whole discussion and your thought process with how we look at all those aspects.

General MICHAEL SCHMIDT. So, sir, where we are is, so again, the engine core upgrade program started under a congressional ad

funding a couple years ago. So, definitely got a head start there, which is good.

Relative to the power and thermal management system, thinking about when we did the business case analysis, we went out to determine how to get the life back in this engine. But we clearly identified during that timeframe that we got a big problem in the future of power and thermal management, which is where got today.

So as we developed the engine core upgrade, yes, I first need, when I talk about power and thermal management, what are the boundary conditions that we want to preserve in the engine core upgrade to give us any amount of margin that can help in a future power and thermal management solution.

I am very much reliant on the OEM [Office of Enterprise Management], Lockheed, to evaluate their airplane. And honestly, they have just been able to use study money to do that. And we do, you know, doing some honestly really good work that I expect our first real input to us to be this fall. But that really needs to get done.

And then there are definitely power and thermal management companies out there that have been working really hard on solutions. And sir, I am anxious to get all of them and get their solutions on the table, and we can truly evaluate those.

I think we need to figure out exactly what the airplane can handle first, but I am anxious for that, sir.

Mr. WITTMAN. Very good. Thank you, Lt. Gen. Schmidt.

Mr. Hunter, Mr. Guertin, I wanted to get your perspective. And we have talked a lot about F-35, but we have to look at how the threat is continuing to develop. We know that NGAD [Air Force Next Generation Air Dominance] and NJAD [Navy Next Generation Air Dominance] are what we are looking at down the road.

Obviously cutting edge technology, looking at where that takes us, both in cost and schedule. We look at where the threat is and what the proposed schedule is for that. But I wanted to get your perspective about where we are with that particular enterprise, Mr. Hunter, and get your perspective, and Mr. Guertin, get the Navy's perspective on that.

Because what I see is somewhat of a divergence there, was for a while Navy saying hey, listen, we want to learn at the same rate as the Air Force does in this next generation air defense platform. But then what we are seeing this year is the Navy going whoa, whoa, wait a minute, we are going to pull back and take some money out of that.

So I wanted to get your perspectives on where we are with that, the importance for the future capability, and how do we, with that capability, learn in the technology developments, too, that our adversaries are putting forward. Because what we don't want is to say, well, we are doing this, and that is in the static realm.

And then all of a sudden by the time we get that aircraft ready to go, we look at it and the counter measures there have already made that aircraft at a much higher risk point than it would be otherwise because the pace at which our adversaries are going.

So give me a perspective there about where we are and then how we are keeping in perspective what the future threat is going to be in relation to where that aircraft ends up when it goes to production.

Mr. HUNTER. Yes, Congressman. Thanks for that question. You know, as the name next generation air dominance and family systems implies, most of the technology work that we believe is necessary to ensure the ability to compete over multiple decades in future air fights is really centralized in the NGAD program.

And it leverages some of these things I have talked about, these government reference architectures that are foundational to that. And foundational to our ability to share technology with the Navy and to leverage their technology, because they have many good and very advanced programs that we look to leverage in our program as well.

And my understanding is that at that level, we are working very well together. And in fact, the Navy is proceeding on the key technologies that we believe we would like to leverage in our approach to the NGAD family of systems.

And we are obviously at a point with our FY 2025 budget request of looking to move NGAD to the next stage and to take some of that technology development we are working on and looking at how do we now move that into fielded systems. And so I would definitely ask for your support for that 2025 budget request.

Mr. WITTMAN. Absolutely, next generation air dominance is going to be key.

Secretary Guertin, if you can reflect, too, on where the Navy is with NJAD and the FY 2025 budget request coming over with a significant reduction, about $1.8 billion. So give us the idea about why the slowing of the steps forward with that and where the Navy sees this.

And Rear Admiral Donnelly, I would love to get your perspective on that too.

Mr. GUERTIN. So thank you, Chairman, for the question, is actually my first question.

Mr. WITTMAN. Good, yeah.

Mr. GUERTIN. So I am very excited for the opportunity. But there is actually isn't a lot of daylight between the Navy and the Air Force in terms of the cooperative development we are seeing across the services. You know, just mark this date, right, this -- we are pathfinding for a level of cooperation between the departments that I think, to be honest, is quite refreshing.

And just like Honorable Hunter said, we have a lot of co-development. Not necessarily co-development, but we are leveraging off of each other. We are working different parts of the problem and working together in a way that is, it is, well, honestly just a little bit surprising.

Mr. WITTMAN. Yeah.

Mr. GUERTIN. Now, they are going to be different jets, right. We are going to do something, we are going to do this trick, right. We are going to take off from an aircraft carrier and we are going to land on it again. So there is some structural elements of what it takes to do that. It is just going to be different. But a lot of the stuff on the inside is going to be highly leveraged.

And another thing that they have started doing that we are teaming on I am particularly passionate about is that to have the government in a better position to manage our business. Having a reference architecture, we can understand how to bring different

capabilities into this jet over its life cycle is something I am particularly interested in, looking forward to partner with the Air Force in going forward.

Is there anything else you want to add on that, Gen. Donnelly?

Admiral DONNELLY. Thank you, Chairman Wittman. As Ranking Member Norcross brought up, it is about the capability. And so Navy firmly sees that the 6th Generation capability that AFX [Adversary Force Exercise] will bring is extremely important to our future port structure and the capability required in the next decade.

I think Mr. Hunter laid it out very well how we establish our understanding of the capability required based on threat assessments, the environment that we are going to operate in and the architecture that will allow us to continue to develop towards that.

It has been well-stated here the cooperation between the Navy and the Air Force, but what I would also bring up is our close cooperation with industry as we develop these possibilities here for the both services' solutions.

With regards to where the Navy is in the budget, there were some obviously very hard decisions to make in 2025, and Navy is prioritizing current readiness, wholeness of capabilities. But we wholly understand that we have to continue to develop this future capability because of the importance it has for our force.

Mr. WITTMAN. Very good. I think one of the aspects of this also with NGAD/NJAD is not just understanding what the future threat scenario would be and what the future countermeasures will be by our adversaries to try to overcome whatever technology we bring to the table. But also to look at our neighbors like CCA.

I think CCA holds a lot of promise for the current aircraft and F-35. As we know, it is meant to be ancillary, not in place of.

But give us your perspective, both Mr. Hunter Mr. Guertin and Rear Admiral Donnelly, about how you see CCA playing a role with NGAD and NJAD. Because not a whole lot has been mentioned about that. We talk about the current scenario now and moving it to the left, getting it out there quickly.

But as we advance that particular platform, give me your perspective on what it does to the capability of NGAD/NJAD.

Mr. HUNTER. Well, sir, our collaborative combat aircraft program is part of the NGAD family system, so it is very much envisioned to be a complementary capability that helps NGAD perform its mission.

Having said that, we anticipate or we project and we are budgeting towards fielding of collaborative combat aircraft on a faster timeframe. So it is not just NGAD that they would be teaming with. Also other systems, other Air Force systems, and also joint systems like the F-35.

Mr. WITTMAN. Do you think what we learn by fielding CCA faster will provide more capability and capacity for NGAD?

Mr. HUNTER. Absolutely. It is leveraging that same architecture, that same industry-based partner. It allows us to exercise fielding of technology in a way that will definitely be supportive of us doing the same thing with NGAD.

Mr. WITTMAN. Sure. Secretary Guertin, I know that Navy has gone down that road too, making looking at CCA a little bit differently, but still in the realm of additional capabilities.

Mr. GUERTIN. Certainly. I would like to answer the question slightly differently --

Mr. WITTMAN. Sure.

Mr. GUERTIN. And show how we are leaning into that aggressively in MQ-25. You know, this is a refueling jet. Maybe we could do some other things later, but my message to industry right now is we need a refueling jet. And so staying clear and consistent on the requirements for that capability.

But as we mature out that technology and get to the point where we can reliably take off and land on an aircraft carrier with an unmanned vehicle to do a, first of all, simple task and then grow it over time and figure out how do we take advantage of CCA. And then build other kinds of capabilities that the airwing of the future can leverage into.

And Admiral Donnelly, I would like you to pick it up from there.

Mr. WITTMAN. Admiral Donnelly?

Admiral DONNELLY. Yes, sir. The only thing I would add is that airwing of the future, and as has been pointed out here by both General Moore and Mr. Hunter, the future fight is about the system, not just about an individual platform. The CCAs we see as a significant part about that. It provides great flexibility and opportunities to the tactical commander because of the risk that can be tolerated with the unmanned autonomous platform.

One of the things I would emphasize is that we are potentially on different journeys between the services because of where these will be based from. But this starts with a tri-service agreement. So there is significant cooperations between each of the services as we develop our approach to this.

There is a shared approach to the tactics that we will employ with these. And beyond interoperability, we are looking interchangeability for the employment of these platforms. So I think we all recognize the value these bring to the future fight.

Mr. WITTMAN. That is great. Yeah, it is I think pretty exciting to see potentially what they can bring to the table.

Lt. Gen. Gering, I want to get your perspective. Because from the Marine Corps' perspective, there are actually two dimensions to CCAs. There is a CCA as an asset in the stand-in force to be an independent asset that can be launched and retrieved there across the Indo-Pacific.

There is also using it as an enabler for the ARG/MEU [Amphibious Ready Group and Marine Expeditionary Unit] and the F-35 bravos that are based on ARG/MEU. So give us your perspective about how the Marine Corps sees the CCA, which is probably a little bit different perspective than the Air Force and the Navy.

General Gering. Chairman, thanks for that question. Yeah, I mean, I think at the wave top, first of all, we are completely aligned with the Air Force and Navy with CCA, and we also have signed the tri-service vision.

Mr. WITTMAN. Yeah.

General GERING. So we think no matter what it looks like or what it ends up being, it has got to be complementary and interoperable, not only with our own force, principally our F-35 fleet, but certainly with the joint force. And that includes beyond 5th Gen. So that is the approach we are taking.

Right now, we are experimenting with the XQ-58. We have conducted two flights to date. We have three more planned this year. The first two were focused more on electronic-type warfare technologies.

And then as we get into the remaining flights, now we are starting about putting it into the link, data link. And then from there for the capstone event, the fifth flight is actually paired up with an F-35.

So we are still on the voyage of discovery there. But to your point, sir, as part of the ARG/MEU, you know, the crown jewel of what we do in campaigning, there is certainly a new aspect that we want to explore and see what is in the art of possible there. But also to your point on being part of the stand-in force, we want to make sure that it is effective in what we need there.

But we are fully committed to this. We think it is an absolute must to pair up with our F-35 fleet going forward, sir. So we are still learning.

Mr. WITTMAN. Very good. Well, folks, thank you, thank so much. You all have I think exhausted all the aspects of tactical aircraft, both manned and unmanned. We appreciate your patience with us in giving us your perspective on what I believe is probably one of the most important paths forward for this nation in countering the threats that we see around the world.

So I appreciate what you do. Anything that you need from us, please know that we are standing by. Again, our effort is to chart the path forward to make sure that we are successful in where we need to be. Congress has to be a partner with you in that.

It has to be a partner with the industry, as much as sometimes we are kind of back and forth about, you know, what has happened to this point. You know, our charge is to make sure that we have that clear path forward to make sure we achieve what we have to achieve to counter the threats that we see before us.

And we cannot underestimate what that is or where they are going. So I am confident that we can surpass them. But it will be a tough job, and it is going to be a 24/7 commitment.

And gentleman, I know that you all have all of that in your hearts and minds going forward. And again, whatever you need from us, know that we are standing by.

So with that, I don't think there are any other questions. With that, the hearing is adjourned.

[Whereupon, at 6:00 p.m., the subcommittee was adjourned.]

A P P E N D I X

APRIL 16, 2024

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

APRIL 16, 2024

Opening Remarks of the Honorable Robert J. Wittman

for the

Tactical Air and Land Forces Hearing on

2025 Budget Request for the Department of Defense's

Fixed-Wing Tactical and Training Aircraft Programs

April 16, 2024

I welcome everyone to our hearing to review the fiscal year 2025 budget request for the Department of Defense's fixed-wing tactical and training aircraft programs. I thank our witnesses for testifying today and look forward to our discussion.

As I've stated numerous times in the past, the National Defense Strategy is clear in its focus on China as our nation's pacing threat. However, I am still concerned the Department's current direction regarding the composition of the U.S. military's tactical fighter force structure and required capabilities still lacks clarity in defining force composition, capability, and capacity objectives.

As I review the plans again for each service like I did last year, two common threads remain particularly concerning. First, our fighter force structure continues to decrease. And second, we are not able to deliver replacement aircraft at affordable prices to achieve similar force structure capacity going forward. And as I've said year over year, our adversaries continue to outpace us, building and fielding their own lethal fighter capacity and capabilities.

For the Air Force, their fiscal year 2025 through fiscal year 2029 plan includes divesting 593 fighter aircraft but only buying back 244 new F-35A and F-15EX aircraft. The F-15EX program of record has been unexplainably truncated from the original 144 aircraft to only 98 aircraft. The Next Generation Air Dominance manned fighters is still many years away from fielding and will cost taxpayers "hundreds of millions of dollars." The Air Force has yet to figure out how they will buy their full complement of F-35A aircraft after noting their primary operating cost assumption of $4.1 million dollars per aircraft per year is unachievable. And while the Air Force's new Collaborative Combat Aircraft concept may hold promise in affordability and making up for fighter capacity shortfalls, there is still a long road ahead integrating autonomous capability seamlessly amongst manned platforms.

For the Navy and Marine Corps, it appears that they still maintain uncertainty regarding new aircraft procurement quantities with their decreased F-35 purchases over the Future Years Defense Plan. For the Navy, funding for the Next Generation Fighter — also known as F/A-XX — decreased by nearly $1.8 billion dollars this year, which is deeply concerning given how

enthusiastic the Navy has been over the past couple of years convincing Congress that this new aircraft is an imperative need.

Finally, I want to discuss the F-35 program given that it is going to comprise a significant portion of our future tactical fighter fleet around the world, presuming we're still able to afford all 2,456 aircraft for the United States, and another approximately 1,000 aircraft for partners and foreign customers.

I want to unequivocally state that the F-35 will be the most advanced tactical fighter aircraft the U.S. has ever built; however, we must accelerate the final fielding of TR-3 hardware and Block 4 software as fast as possible. Although the program recently completed Initial Operational Test and Training activities and achieved the full-rate production milestone, we're still not out of the woods yet on this program. One of the biggest challenges surrounding this program is its need to better develop, test, and modify mission software to enable the quicker and more reliable fielding of operational capabilities to pilots. It's troubling that the most capable fighter ever built is reliant upon decades old software infrastructure and processes, while the United States must keep pace with an agile and very

capable adversary. TR-3 still struggles to get delivered and we have numerous new aircraft stacking up on the production line awaiting acceptance and delivery. Last March, we were told that TR-3 would likely begin deliveries this month. That has not occurred, and it's now forecasted to begin delivery later this summer. Cost growth is upwards of over $900 million over budget, with the government responsible for funding 80% of the cost overrun. Additionally, when TR-3 aircraft do begin delivery, it will still take another 9 to 12 months for the software to achieve full functionality for any combat operations.

The F-35 propulsion and thermal management system modernization continues to progress in its nascent stages. This committee continues to gather facts and data about the existing problem and potential solutions. I'd like to understand more from our witnesses about the avionics cooling requirements that have been finally set by the services, in addition to understanding the technical risk, schedule, and system integration assessments the program office performed related to the major subsystems for power and fuel thermal management and electrical generation in making this proposal. It's imperative we understand the

requirements and solutions that are being reviewed to sustain this vital combat capability over the next 50-plus years.

Finally, I would note that our nation's top defense tester Dr Schmidt has indicated that he is conflicted in matters related to Lockheed Martin and has indicated his intent to recuse himself on related matters. By statute, the Director of Operational Test and Evaluation has a unique role in providing congress an unvarnished assessment as to the adequacy of the most complex and costly acquisition programs like the Joint Strike Fighter. I look forward to better understanding how Dr Schmidt intends to perform that role with his conflict.

I again thank the witnesses for appearing before us, and I now yield to the Ranking Member from New Jersey, Mr. Don Norcross, for his opening remarks.

Mr. Norcross Opening Statement (As prepared) 4/16 TACAIR Hearing

I thank all the witnesses for their time and look forward to our discussion today.

In reviewing the Air Force, Marine Corps, and Navy tactical aircraft requests this year, the justification is as great as ever for this subcommittee's continued detailed oversight of these large, complex, and expensive programs.

This hearing is one of the most important we do every year; and, understandably, we often focus most on issues related to cost, performance, schedule, and management of these programs.

However, with this budget request, we need also to get answers from our witnesses about how they are assessing and managing strategic risk associated with our tactical aviation force structure. For example:
* The Air Force will procure 60 aircraft in FY25, which represents a reduction of 12 aircraft from what last year's budget request projected. Additionally, the Air Force plans to retire 190 aircraft, a net loss of 130 tactical fighter aircraft.
* If you compare FY25 through FY29, the Air Force plans to procure 244 tactical fighter aircraft, and retire 594, for a net loss of 350 aircraft.

I have generally supported plans to retire current systems that no longer meet capability requirements, or that are not relevant to the modern battlefield. We must ensure, however, that we are not taking too much near-term risk by retiring too much capacity too soon. Our Air Force witnesses should help us understand the risk they see in their plan and why that risk is acceptable.

For the Navy, I was pleased to see that you have contracted for the final F/A-18 Super Hornets. It also appears that your Service Life Modernization program will rapidly increase the quantity of Block 3 Super Hornets across the fleet. Recent analysis shows that you will now close the Strike-Fighter shortfall in FY25.

I'd like our Navy witnesses today to explain how F-35C procurement and fielding plays into your Strike-Fighter shortfall analysis, and then whether the Navy's continued slow ramp for F-35C procurement could eventually create another strike fighter shortfall.

I am happy to see the Marine Corps continue to aggressively procure and field F-35 aircraft, as they retire their AV-8B Harriers and F/A-18C Hornets.

More importantly the Marine Corps has reversed course on last year's plan to reduce the number of F-35 aircraft per squadron and will now field 12-aircraft per squadron. I think this plan supports the Marine Corps generation of higher sortie rates needed in a crisis. Moreover, it's encouraging that the Marine Corps can and will reverse course when the underpinning analysis changes.

Turning to the F-35 program – although this program has many accomplishments, it also suffers from chronic delays and cost overruns. In particular:

* Engine life reductions due to excessive bleed air demand;
* Technical Refresh 3 hardware immaturity;
* Block 4 software instability; and,
* Full Mission Capable rates that fall well below what the services require.

There's no doubt this program is too slow to deliver to the force. I'd like Lieutenant General Schmidt to explain how he will manage the development and integration risk for these various efforts but also what actions he's taking to better deliver capability to the services.

Sticking with F-35, to the extent possible in an unclassified setting, I'd like Dr. Schmidt from DOT&E to explain his conclusions and recommendations regarding the recent F-35 Initial Operational Test and Evaluation; and, I'd also like Lieutenant General Schmidt to explain how he's getting after these recommendations.

We have a lot to discuss today. I thank the witnesses for their appearance today and look forward to their testimony.

Thank you, Mr. Chairman. I yield back.

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

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

HEARING DATE/TIME: April 16, 2024, 3:30PM

SUBJECT: Air Force, Fixed-Wing Tactical and Training Aircraft Programs

STATEMENT OF:

Hon. Andrew P. Hunter
Assistant Secretary of the Air Force
(Acquisition, Technology & Logistics)

Lt. Gen. Richard G. Moore Jr., USAF
Deputy Chief of Staff
(Plans and Programs)

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

INTRODUCTION

Chairman Wittman, Ranking Member Norcross, and distinguished members of the subcommittee, thank you for having us here today to provide testimony on The Department of the Air Force's (DAF) Fiscal Year 2025 (FY25) President's Budget (PB) request for fixed-wing tactical and training aircraft programs.

The Department of the Air Force is critical to our national defense. Our capabilities underwrite the capabilities of the entire of the joint force, and we are uniquely suited to provide this cornerstone of the Nation's defense. This is particularly true of the long-range strike and power projection capabilities that are the purview of this subcommittee and that we will discuss today.

The Department of the Air Force's FY25 PB request reflects our commitment to developing a threat-informed, concept-driven future Air Force but resources have been limited by the 2023 Fiscal Responsibility Act (FRA). The FRA spending caps increase risk and force difficult tradeoffs. We have made significant progress in identifying the capabilities the DAF will need to develop and field to prevail against our adversaries. However, the DAF is facing a significant, dangerous shift in the strategic security environment. The DAF has historically adapted to key inflection points to best compete in emerging security landscapes. We must reoptimize to pivot from supporting post-9/11 conflicts and demands to deterring, and if necessary, winning, conflicts in an era of Great Power Competition (GPC).

The Secretary of the Air Force has made clear we are out of time and must reoptimize now. To achieve a more competitive posture, the DAF is implementing major changes centered on how we develop people, generate readiness, project power, and develop integrated capabilities. The Operational Imperatives work highlighted the challenges of integration and the importance of tight partnerships between the operational and acquisition communities. The capability development-related GPC organizational changes we are making at the Secretariat and Air Force Materiel Command levels institutionalizes these lessons learned. The DAF is establishing a single authoritative entity focused on identifying and prioritizing future operational capabilities, driving cross-platform mission systems integration and capability development, establishing focused acquisition Systems Centers for effective portfolio and lifecycle management, and standing up relevant Secretariat offices to inform senior leaders on

enterprise decisions. This will result in a more agile and integrated acquisition system that delivers capabilities—quickly and at scale.

Since time is of the essence in capability development we are thankful for Congress providing the Section 229 "Quick Start" provision in the FY24 NDAA and we look forward to providing information on the specific initiatives using this authority in the near future. While grateful for the support, we continue to be hampered by funding through Continuing Resolutions and restrictions on the retirement of outdated fighter, tanker, cargo, and command and control aircraft. Compromises that divert focus from our operational imperatives put our military's ability to deliver decisive combat power at great risk. We are conscious of the difficulties associated with these changes and are eager for continued collaboration with Congress, industry, and the communities that support our Air Bases to ensure our Nation's security.

CURRENT CAPACITY AND CAPABILITY

Following National Defense Strategy (NDS) guidance, the DAF seeks to invest in technologies and field systems that are both lethal and survivable against tomorrow's threats. This ultimately means transitioning away from many legacy platforms to free up manpower and resources to modernize and field more credible systems. If we are to modernize to address the emerging threat, we must use resources tied to our legacy platforms and weapons systems that are decreasing in relevance today and will be irrelevant in a future peer conflict. Retaining systems that have either limited contributions, or are simply not relevant in the future fight, delays modernization and exacerbates future capability gaps. If deterrence fails, our Airmen must have the training, tools, platforms, and operating systems required to win. We must strike a balance between risk in the near-term and risk in the future.

Fighter Force Structure

The Air Force must continue to evolve its fighter force to meet the pacing challenge posed by the People's Republic of China (PRC) and the acute threat posed by Russia and ensure the capability and capacity to meet worldwide demands today. Extensive gaming and analysis using the most difficult problem and the most difficult scenario, shows that the Air Force must adjust the future fighter force structure mix by changing investment priorities to provide the capability, capacity, and affordability required to defeat any peer threat. The threat will not allow

the Air Force to just retain and modernize our current fleets. Modernization programs cannot transform our current fourth-generation fighters into fifth-generation fighters, or our current fifth-generation fighters into Next Generation Air Dominance (NGAD).

In realistic budget projections, we must balance the need for high end technology with affordable capacity. To attain this desired fighter fleet, the Air Force must continue to right size current aircraft inventories to expedite the transition away from less capable, aging aircraft and emphasize investment in future capabilities such as NGAD and F-35 modernization. The desired Air Force fighter fleet should match capability and capacity of both platforms and weapons to mission requirements. As part of its force structure change, the Air Force must transition its fighter fleet from seven platforms (i.e., F-35, F-22, F-16, F-15EX, F-15E, F-15C, A-10) to four (i.e., NGAD, F-35, F-15E/EX, F-16) plus Collaborative Combat Aircraft (CCA).

On the path to achieving the desired future fighter fleet, the FY25 PB continues to seek opportunities to divest capabilities that are not consistent with pacing challenges and focus on the key capabilities required to execute the NDS. Moving away from outdated and less capable legacy platforms allows us to redirect manpower to our newest aircraft/platforms, many of which require both experienced maintainers and experienced pilots to maintain our competitive edge. These divestitures are critical to building a relevant future force capable of meeting the pacing challenge. Resourcing those future capabilities and modernizing our remaining force demands both money and manpower currently tied up in our legacy systems and platforms.

Fighter Force Structure Studies

Our fighters are becoming significantly more expensive to sustain as they age. The average age of the Air Force fleet is 26 years which is significantly higher than all other Services. Weapons System Sustainment (WSS) costs have increased approximately 40% above inflation over FY16-27. We need new platforms and weapons to replace an aging force, but also must invest in cutting edge technology needed to confront and outpace threats.

Both internally and alongside the Office of the Secretary of Defense, the Air Force has performed a Tactical Aircraft (TACAIR) analysis to evaluate how efficiently different force mixes meet future warfighting challenges in the 2035-2040 timeframe. Specifically, this study focused on fighter force mixes and quantities that were both affordable and militarily effective. The Air Force TACAIR Study was an initial step in creating a long-term plan for our fighter

force. While this study was not published, it was used internally by the Air Force to inform both FY25 and future year programming efforts.

Fighters

F-35

The FY25 PB prioritizes investments in F-35 modernization, infrastructure, and advanced weapons, and commits $5.9B to procurement, $1.2B to development and $2.8B to sustainment. The FY25 PB request for 42 F-35A aircraft represents a decrease of 6 aircraft from the FY24 PB position for FY25. Decreasing F-35A procurement was not an arbitrary decision. Reducing aircraft quantities enables the Air Force to fund unplanned increases to F-35 support costs without significant increases to the F-35 budget. Additionally, slowing the pace of procurement allows added flexibility for Lockheed Martin to work through the issues related to Block 4 development and integration.

Propulsion and power-thermal-management-systems-development investments help ensure capability enhancements continue to be viable for the platform as demands increase, while also reducing lifetime sustainment costs. Development funds also address a critical shortfall of F-35A flight test aircraft, which, alongside System Integration Lab (SIL) resources are major F-35 modernization enablers.

The F-35 is the cornerstone of our future fighter fleet, and as of March 2024, 409 F-35As are fielded. Although a formidable platform today, the Air Force must continue to smartly modernize the F-35A fleet to keep pace with potential adversaries on relevant timelines. The current program-wide focus remains Tech Refresh-3 (TR-3) certification and maintainability, which are the foundations for Block 4 capability upgrades and are designed specifically to compete in the highly contested fight in INDOPACOM and EUCOM.

The Air Force is committed to controlling F-35 costs for both production and sustainment, as well as maximizing mission readiness. The Lighting Sustainment Center delivers global support to U.S. Services, F-35 Partners, and Foreign Military Sales customers around the world. In response to the FY22 NDAA Section 142 mandate, the Air Force is working with the Office of the Secretary of Defense, the Department of Navy, and the JPO to assume greater management, planning, and execution roles of sustainment functions, both to improve aircraft availability and further reduce sustainment costs.

F-22

The F-22 is the Joint Force's preeminent air superiority fighter and the only operational weapon system capable of countering pacing air threats at scale into the 2030s. To date, its combination of stealth, supercruise, maneuverability, and integrated avionics have given it "First Look, First Shot, First Kill" capabilities against adversary platforms, but it requires an aggressive modernization strategy to ensure continued advantage against emerging threats in highly contested environments. The FY25 PB request furthers F-22 Modernization with continued development and integration of sensor enhancements (SeE), communication systems (Link-16 and Mode 5 Challenge and Reply), navigation systems (EGI-M and Controlled Reception Pattern Antenna-CRPA), and other performance upgrades.

The FY25 RDT&E request of $768.6M greatly expands survivability by beginning the Infra-Red Defensive Suite (IRDS) Gen III integration effort, while maintaining continued developments across the entire F-22 modernization portfolio. The FY25 procurement request of $934.2M ramps up production of Mode 5 and Low-Drag Tanks and Pylons (LDT/P) kits that are essential to reduce fratricide potential and extend maximum combat sortie ranges and durations.

To resource these F-22 modernization efforts and invest in sixth-generation platforms (Next Generation Air Dominance), the Air Force has sought to divest F-22 Block-20 Formal Training Unit (FTU) and Test aircraft in the FY23 PB, FY24 PB, and FY25 PB. However, the 2023 NDAA prohibits divestment of F-22 aircraft through FY27. F-22 Block-20 aircraft are currently in their third decade of operations, with the highest operating costs of any Air Force fighter, and do not possess the combat capabilities resident in the F-22 Block-30/35. The Air Force remains committed to delivering air superiority to the Joint Force in the highly contested environment.

F-16

The FY25 PB reduces the F-16 total aircraft inventory (TAI) by 11 aircraft, to 830, and continues modernizing the post block fleet (i.e., Block 40/42/50/52) to improve survivability and offensive viability into 2040s, filling mission roles in conjunction with fifth- and sixth-generation fighters.

The FY25 PB requests $107M in RDT&E to continue Operational Flight Program software updates to integrate new mission capabilities, weapons, targeting pods, and improved avionics, in support of NDS priorities.

Additionally, the FY25 PB requests $231.9M for procurement efforts to upgrade core mission computer sub-systems to realize full Active Electronically Scanned Array (AESA) radar capabilities, replace or repair aircraft-life-limiting components, upgrade the Communications Suite to meet crypto mandates, and continue AESA radar installations. FY25 PB F-16 investments align with FY24 PB priorities and support the DAF fighter roadmap.

F-15 Divestments

In FY25, F-15C/D fleet recapitalization continues, and the Air Force plans to divest 65 F-15C/D aircraft, many of which are beyond their service life and have serious structures risks, wire chafing issues, and obsolete parts. The Air Force also begins divesting part of the F-15E fleet, retiring 26 of the older aircraft which possess the less capable, Pratt & Whitney 220- engines. F-15 divestments make way for Air Force modernization, which includes F-15EX procurement to replace the aged F-15C/D aircraft, as well as F-15 Eagle Passive/Active Warning and Survivability System (EPAWSS) procurement, to increase the F-15 fleet's capability and readiness.

F-15EX

The FY25 PB includes $1.8B to procure 18 Lot 6 aircraft and 6 pairs of conformal fuel tanks (CFTs). The funds also support requirements for a sixth operational location, which requires investment in spare parts, support equipment, training, and other support requirements. Finally, the procurement request includes funds to stand up organic, depot-maintenance repair capabilities. This request supports a total F-15EX fleet of 98 aircraft (6 fewer than in the FY24 PB) and would bring total CFT inventory to 18 pairs (12 pairs funded in FY24), enough for one squadron.

As of January 24, the Air Force accepted six F-15EX test aircraft, located at Eglin Air Force Base. The Air Force expects to have accepted 12 F-15EXs by the end of FY24, then receive 17 in FY25, growing the inventory to 29 aircraft.

The FY25 budget contains $56.2M in RDT&E funds to continue F-15EX non-recurring engineering (NRE) and integration development efforts, including incremental funding for the Automatic Ground Collision Avoidance System (AGCAS) and new Flight Control Computer (FCC).

- Forward fuselage redesign challenges delayed six Lot 1 aircraft deliveries. The final two Lot 1 aircraft are projected to deliver by June 24, eight months later than projected during the FY24 PB rollout, but still within the program baseline threshold.
- Cartridge/Propellant Actuated Devices (CAD/PADs) shortages, which have been mitigated through Lot 3 delivery (November 25). The Air Force an industry remain engaged to mitigate CAD/PAD risks to Lot 4 and beyond.
- Gun System shortages: DAF, Boeing, & Gen. Dynamics have collaborated to resolve the issue. All operational aircraft will deliver with their gun system installed.

F-15 Modernization (Including EPAWSS)

The Air Force continues investments in the F-15 fleet to improve survivability and lethality within highly contested areas. The future F-15E/EX fleet will bring substantial capacity for over-sized long-range fires, sensors, and electronic warfare capabilities to complement fifth- and sixth-generation aircraft and defend critical locations.

The FY25 budget includes $357.6M in procurement funds to order F-15 Eagle Passive/Active Warning and Survivability System (EPAWSS) kits for 21 F-15E aircraft, install EPAWSS on 14 F-15E aircraft, procure initial spares, provide for interim contractor support (repair capabilities), and support other program requirements. The procurement request also supports other F-15E system modernization, many of which are necessary to comply with National Security Agency and Federal Aviation Administration mandates. Specifically, the request funds hardware, installation, and/or interim contractor support for new or improved subsystems, which include a mission computer, tactical datalink system, radio for satellite communications, and data transfer module.

The FY25 budget includes $178.6M in RDT&E to support F-15 annual software releases and flight test infrastructure for developmental and operational test requirements of the F-15 platform and various defense weapon systems. The annual Operational Flight Program software

updates integrate new hardware and weapons, counter emerging threats, and react to emerging safety of flight issues, preserving the F-15's survivability and lethality.

A-10

The FY25 PB does not include development or procurement requests, in accordance with the Air Force plan to divest the entire A-10 fleet by FY28 and constraints imposed by the "Sunset Clause" (10 USC Sec 2244a) prohibiting the bulk of A-10 modernization and associated procurement. Although the A-10 has limited applications to higher-tier NDS priorities and limited survivability in the evolving global threat environment, the fleet is sufficiently modernized to meet operational needs over the next five years and to operate safely through platform divestment.

Next-Generation Air Dominance (NGAD) Family of Systems - Platform and Collaborative Combat Aircraft (CCA)

The FY25 PB requests approximately $3.4B to fund the development, testing, and experimentation of both NGAD and CCA, as well as CCA integration with fifth-generation crewed platforms. The CCA program will begin concept refinement for the next CCA Increment (CCA Inc 2) and explore international partnership participation.

In 2024 the Air Force will award an Engineering and Manufacturing Development (EMD) contract for the NGAD crewed platform, and CCA will option award one or more vendors to complete detailed design, build prototypes, and test production-representative test articles. These activities, guided by a family-of-systems acquisition approach, will continue into FY25.

Advanced Engine Development

The FY25 PB request includes $562.3M in RDT&E for development of Next Generation Adaptive Propulsion (NGAP) prototype engines. The NGAP program builds on Adaptive Engine Transition Program prototyping to further advance adaptive cycle engine performance and size scalability key to enabling future air dominance capabilities. NGAP funding supports production and test of a prototype engine by each of two contractors, preserving competition and key engine design and manufacturing skills. The program is also driving digital transformation of the propulsion industrial base to reduce future integration risks

while shortening development timelines. This continued investment in the advanced propulsion and digital transformation of the industrial base are key factors in maintaining the U.S. strategic advantages in propulsion technology and development capability over competitors and adversaries.

Munitions

AMRAAM

The FY25 PB request for AMRAAM continues investment in the next generation medium and long-range air-to-air missiles. AMRAAM continues to be the Air Force's premier beyond visual range, all weather, launch and leave medium range air-to-air missile that can defend against more advanced threats in a highly contested environment. The Air Force is requesting $447M for 462 to maximize production capacity through the future years defense program.

JASSM

The FY25 PB request for JASSM continues investment in the long-range conventional air-to-surface missiles. JASSM continues to be the Air Force's premier autonomous precision guided standoff cruise missile; able to attack fixed or relocatable targets. The FY25 PB requests $825M of missile procurement funding for 550 missiles that supports the continued multi-year procurement strategy, initiated in FY24. In the FY25 PB the Air Force also requests $184M of RDT&E to support the development of the B-3 and D variants of the JASSM. This funding supports Software development, Weapon Data Link (WDL) development for the JASSM-D, and weapon test and evaluation. These RDT&E efforts support fielding the B-3 and the D variants in FY27. The Air Force will continue the purchase of the M-code enabled B-3 variant, and the post-launch retargetable D variant for all future lots.

LRASM

The FY25 PB request for LRASM continues investment in the long-range conventional air-to-surface missiles against high-threat maritime targets. LRASM is highly leveraged on the design of JASSM-ER with over 70% hardware commonality and shares the same production assembly line. The Air Force requests $354M of missile procurement funding for 64 C-1 and 51

C-3 missiles that supports the LRASM MYP and lot 9 procurement of AGM-158C and AGM-158C-3 variants. The Air Force will continue to purchase the C-3 variant in FY26 Lot 10. The LRASM AGM-158C-3 variant will be a forward fit Engineering Change Proposal (ECP) to the AGM-158C, to enhance long-range strike and existing Offensive Anti-Surface Warfare (OASuW) capability. Beginning in FY26 through the outyears, the Air Force will be procuring LRASM C-3 only, until the missile inventory objective is met. The US Navy has oversight and primary management authority for the LRASM program, to include system development, with interest from the DAF as the lead for weapons procurement and contracting.

Stand-in Attack Weapon (SiAW)

The Air Force continues to invest in technology to counter future peer threats and continues development of the Stand-in Attack Weapon (SiAW) to deliver a strike capability to defeat rapidly relocatable targets, a hallmark of the highly contested environment. SiAW is the munition that gives the F-35 unique air-to-surface capabilities in the high-end fight for the Joint Force. The FY25 PB requests $376M for SiAW development and prototyping, along with $173M in procurement funding to field Advanced Anti-Radiation Guided Missile Extended Range (AARGM-ER) on the F-35 as an interim capability.

Air-Launched Rapid Response Weapon (ARRW)

The FY25 PB does not include a request for ARRW RDT&E or procurement funding. ARRW recently completed the final test of its All-Up Round executed under rapid prototyping authorities in March 2024. While future ARRW decisions are pending final analysis of all flight test data, the service is pleased to report that the ARRW rapid prototyping program is a categorical success.

Though specific test objectives cannot be provided in an unclassified forum, the test acquired valuable, unique data and was intended to further a range of programs such as ARRW and Hypersonic Attack Cruise Missile (HACM). It also validated and improved the Air Force's test and evaluation capabilities for continued development of advanced hypersonic systems.

Hypersonic Attack Cruise Missile (HACM)

The FY25 PB request of $517.0M in RDT&E for the Hypersonic Attack Cruise Missile (HACM) development allows the Air Force to mature HACM through ground and flight testing, continue model-based engineering and digital ecosystem, complete critical design, and increase production readiness. Funding will support finalization of design verification testing, execution of initial qualification testing, and aircraft integration activities required for the HACM flight test campaign in FY25 through FY27 and enable production article procurement by FY27.

Rotary

HH-60G and HH-60W (Combat Rescue Helicopter)

The Air Force is the only Service with a dedicated force organized, trained, and equipped to execute theater-wide Personnel Recovery. The HH-60G fleet currently accomplishes this mission by conducting day, night, and marginal weather Combat Search and Rescue (CSAR) operations to recover isolated personnel in hostile or permissive environments. The planned fleet of 86 HH-60W will replace the HH-60G in this role. The FY25 PB requests $2.1M in procurement for the HH-60G and $52.3M in RDT&E and $193.5M in procurement for the HH-60W program.

MH-139A

The MH-139A program is a critical element of the Air Force nuclear enterprise modernization initiative. This program will deliver 42 replacement helicopters, training devices, and associated support equipment to replace the legacy UH-1Ns for Air Force Global Strike Command. Air Force District of Washington, Fairchild AFB, WA, Kirtland AFB, NM, and Duke Field, FL, will continue to fly the UH-1Ns. The FY25 PB requests $333.5M in procurement for the MH-139 program, which will fund Low-Rate Initial Production for eight aircraft, training devices, and support equipment. The first six aircraft continue to be used to finalize test and development. The first Low-Rate Initial Production lot will deliver 13 aircraft in FY25 and the second Low-Rate Initial Production lot will deliver 7 aircraft in FY26.

CV-22

The CV-22 is the Air Force variant of the joint V-22 tilt-rotor aircraft. It allows for long-distance, terrain following, vertical lift operations with increased survivability and is the only high-speed vertical lift platform in the Air Force inventory. The Air Force lost eight Airmen in a CV-22 Osprey mishap on November 29, 2023, off the shore of Yakushima, Japan. In response, Lieutenant General Tony Bauernfeind, Air Force Special Operations Commander, convened safety and aircraft investigation boards to determine the cause of the mishap and the tragic loss of life. On 6 December 2023, Lieutenant General Bauernfeind directed an operational stand-down of the Air Force CV-22 aircraft to mitigate risk during the mishap investigation. It has been determined that a materiel failure of a component led to the mishap. Furthermore, information from the Air Force Safety Investigation Board and an evaluation of historical data from over 750,000 V-22 flight hours identified the need for additional maintenance and procedural controls to mitigate risk. Institution of these controls and a safety focused, multi-phased approach for maintainers, aircrew, and aircraft enabled a return to flight authorization on 8 March 2024. Full operational capability of the CV-22 is expected in summer 2024 The FY25 PB requests $84.8M to continue development and modifications to increase CV-22 fleet reliability, capability, and survivability. Investments in these areas will ensure the CV-22 fleet remains ready, reliable, and relevant in the future. Notable investments include the Block 20 Mission Computer Obsolescence Initiative to replace older mission computers and upgrades several avionics systems. Additionally, investments in Nacelle Improvement include redesigned wiring and structural improvements of the nacelles designed to increase aircraft availability by over 5%.

Trainers

T-1, T-6, and T-38

The Air Force is continuing investment efforts in its legacy trainer platforms, including critical modernization programs for the T-6 and T-38 fleets. The T-1A FY25 PB request of $0.133M in procurement funds low-cost modification efforts of the T-1A. The divestment of the T-1A fleet is currently paused until the Air Force accomplishes the guidance set forth by the FY24 NDAA. Training of future Mobility pilots and Combat System Operators, currently being conducted in the T-1A Aircraft, will be accomplished in simulators.

The T-6 FY25 PB request of $130.2M in procurement and $38.6M in RDT&E supports the procurement of Crash Survivable Recorders and the continued development of Avionics Replacement Program (ARP). In FY25, the T-6 will begin a major ARP to address Diminishing Manufacturing Sources and Material Shortages (DMSMS) for critical avionics issues.

Continued investments are also required for the modification and sustainment of the T-38 fleet until the T-7A becomes operational. Programs include avionics updates, and structural life extension programs such as Pacer Classic III, and the Talon Repair, Inspections, Maintenance program. The T-38 FY25 PB requests $115.5M in procurement to support the procurement of kits that will update the T-38 avionics and extend the structural life of the T-38.

T-7A

The T-7A aircraft and simulators will fill training capability gaps for fourth- and fifth-generation fighter aircraft by replacing T-38C aircraft and simulators used in the advanced fighter/bomber track of Specialized Undergraduate Pilot Training, Introduction to Fighter Fundamentals, Euro-NATO Joint Jet Pilot Training, and Pilot Instructor Training. On 27 September 18, a $9.2B fixed price contract was awarded to the Boeing Company, providing for the anticipated delivery of 351 aircraft, 46 associated training devices, and other ancillary supplies and service. The first T-7A aircraft and simulators are scheduled to arrive at Joint Base San Antonio-Randolph in 2025. All undergraduate pilot training bases will eventually transition from the T-38 to the T-7A. The combination of digital engineering and early prototyping enabled the T-7A program to identify and resolve unfavorable control and handling characteristics at the early stages of development. The utilization of Boeing owned T-7 prototypes has supported the Advanced Pilot Training acquisition schedule.

The Air Force and Boeing have made significant progress in resolving the egress system and flight control law issues that led to the delay of Milestone C from FY23 to FY25. Numerous studies and re-design have led to the increased safety of the egress system and refinement of the flight control software. The program will validate the design changes by conducting a total of 22 test shots. The Air Force and Boeing will continue to work together to ensure the timely resolution of issues as the T-7A progresses through the EMD phase.

First Flight of the T-7A occurred on 28 June 23 at the Boeing facility at St Louis MO. The Air Force accepted its first EMD aircraft (APT002) on 15 September 23 and conducted its

first flight test on 20 December 23 at Edwards AFB. Since its first flight tests APT002 has conducted multiple flutter flight tests. Additionally, APT003 has completed initial climatic tests at Eglin AFB. Boeing has also delivered APT001 and it will conduct loads test at Edwards AFB. Finally, in mid FY24, the program will conduct critical High Angle of Attack flight tests using Boeing owned prototypes to validate design refinements to its flight control software. Boeing is expected to deliver the final two EMD aircraft by the end of the second quarter of FY24.

The FY25 PB request of $83.8M in RDT&E funds the testing and development of the EMD aircrafts and Ground Based Training Systems (GBTS). Additionally, the FY25 PB request of $277.8M in procurement funds the first seven Low Rate Initial Production (LRIP) aircraft, associated spares and GBTS devices. The Air Force remains focused on working with Boeing to enable the T-7A program to achieve Milestone C.

Command and Control

E-7A Wedgetail

FY25 PB includes $417.7M to continue rapid prototyping of the first 2 E-7 aircraft in support of a production decision in FY26. To support Joint and coalition forces, the Air Force must provide a mix of space and airborne sensors and decision support capabilities for Command and Control (C2) and Airborne Moving Target Indicator (AMTI) in the air domain. AMTI investment is essential to countering advanced and emerging air threats fielded or in development by adversaries. While the E-3 lacks the capability to support high end operations and cannot be modified to close existing Airborne C2 and AMTI capability gaps, the Air Force is committed to sustaining and maintaining the remaining 16 AWACS to be operationally ready.

Boeing's proposal for the Rapid Prototyping Program was much higher than expected, so the Air Force is evaluating courses of action to determine the best way forward. At this time, Air Force's primary focus is working with Boeing to get the E-7 platform to a level of affordability the Service can prudently pursue and to successfully demonstrate the Rapid Prototyping phase of the program. Office of the Secretary of Defense and Air Force worked to rephase planned production decisions and funding to support Rapid Prototyping Program

contract negotiations and definitization efforts.

The United States Air Force, the Royal Air Force, and the Royal Australian Air Force are committed to collaborating on E-7 programs for mutual benefit through cooperative capability development, evaluation and testing, interoperability, sustainment, operations, training, and safety.

E-3 AWACS

The E-3 Airborne Warning and Control System (AWACS) aircraft continues to be a worldwide integrated battle management command and control (BMC2) surveillance, target detection, and tracking platform. The aircraft has been in service since the mid-1970s. Due to its age and sustainability issues, the E-3 AWACS has become increasingly expensive to support. It also lacks sufficient capability and capacity to operate in a near peer conflict to meet the combatant commander needs. Divesting part of the fleet will temporarily improve sustainability by adding high demand-low availability parts back into the supply chain. As part of the previous FY23 and FY24 PBs, the Air Force divested a total of 15 AWACS aircraft, leaving a total of 16 aircraft to remain operational until its replacement, the E-7 Wedgetail, is delivered to the warfighter.

The FY25 PB requests $67.6M in procurement to complete final modifications necessary to meet system operational mandates and address diminishing manufacturing sources as part of our commitment to ensuring E-3 AWACS mission readiness.

EA-37B Compass Call

Compass Call is the DAF's only wide-area, standoff, Airborne Electromagnetic Attack (AEA) Command and Control Warfare/Information Operations weapon system. The Compass Call program is currently undergoing a re-host effort to transition the capability from the EC-130H to the EA-37B in order to maintain U.S. Electromagnetic Spectrum (EMS) Superiority in future conflicts. The EC-37B was redesignated to become the EA-37B, which better identifies the platform's mission of offensive electronic attack. The Air Force greatly appreciates the ongoing Congressional support to the Compass Call program. To date, ten EA-

37B aircraft have been procured and are at various stages of modification, with limited fielding for training only in FY25, and initial operational fielding in FY26.

With the FY25 PB, the Air Force will be focused on completing Developmental and Operational Test for the rehosted EA-37B capability, as well as furthering development of the mission system upgrade for fielding System Wide Open Reconfigurable Dynamic Architecture (SWORD-A) capabilities. The open and agile architecture of SWORD-A will enable a more rapid response capability against emerging threats and will be the foundation for future baseline upgrades.

Intelligence, Surveillance, and Reconnaissance

MQ-9

The FY25 PB of $19.5M aimed at providing needed capabilities to the Combatant Commands. To date the MQ-9 fleet has flown over 3 million hours, with the vast majority of those hours supporting combat operations.

MQ-9 efforts include the continued fielding of MQ-9 Multi-Domain Operations (M2DO) capabilities improvements. Enhanced Power and Anti-jam GPS are already fielded to a portion of the fleet. The remaining focus is on completing Command and Control Resiliency and accelerating the effort as much as possible.

The FY25 PPB request continues removal of excess aircraft from the fleet between FY23-27. In FY23, the Air Force removed 100 MQ-9A Block 1 aircraft. In FY24, the remaining 48 Block 1 aircraft will be removed from the fleet and the Air Force will finalize transfer of 10 aircraft to the Marine Corps. The Air Force will remove high time Block 5 aircraft between FY26 and FY27. The AF has enough Block 5 aircraft to maintain current operations through the end of the FYDP.

RQ-4 Global Hawk

FY25 PB request focuses on maintaining the nine-airplane fleet, Multi-Platform Radar Technology Insertion Program (MP-RTIP) sensor, and ground systems at a minimum viable level until divestment. The Global Hawk will divest when replacement capabilities are available, a change from the FY24 PB request in which divestiture was scheduled for FY27.

The FY25 PB requests $9.5M in RDT&E to support ongoing engineering and logistics effort for all Global Hawk projects required for sustainment.

DAF BATTLE NETWORK

DAF Program Executive Officer for Command, Control, Communications, and Battle Management (DAF PEO C3BM) is the acquisition lead alongside the Advanced Battle Management System (ABMS) Cross-Functional Team (CFT) which is the operational lead for the development of the DAF BATTLE NETWORK, which aligns USAF & USSF command, control, and communications (C3) capabilities across 50+ core programs to fuse sensors, effectors, and sustainment grids for decision advantage. The Advanced Battle Management System (ABMS) is the budget Program Element which funds key architecture development, software and applications, digital infrastructure, and aerial networking capabilities to the integration of C2 capabilities for the DAF BATTLE NETWORK.

The FY25 PB requests $743.8M within the ABMS PE to support the continued development of the DAF BATTLE NETWORK architecture and enabling infrastructure. It allows for the additional development of a DAF architecture and analysis for relevant contested air, space and contested maritime mission threads. It also enables the design, testing and initial deployment of digital infrastructure to INDOPACOM, EUCOM and NORTHCOM delivered through five programs of record spanning the development of a software defined wide area network, deployable, mobile and fixed digital infrastructure, and deployable systems.

Additionally, the FY25 PB request supports the continued development of key Command and Control (C2) software programs, including Cloud-Based C2 (CBC2) which is currently delivering capability for homeland defense to NORAD/NORTHCOM, and two additional programs focused on the development of a common user interface for battle management command and control (BMC2) and sensor orchestration.

Finally, the FY25 PB request supports continued development of aerial networking capabilities through the Phalanx Griffon program, which will develop the technical framework to expand airborne edge networking capabilities to deliver both data and internet protocol routing between tactical aircraft and the DAF BATTLE NETWORK. These investments in FY25 will enable broader fielding of C3 capabilities in FY26 and beyond.

Thank you again for the opportunity to testify. We look forward to working with this subcommittee to ensure the Department of the Air Force maintains the necessary military advantage to secure our vital national interests and support our allies and partners in Fiscal Year 2025 and beyond.

BIOGRAPHY

DEPARTMENT OF THE AIR FORCE

ANDREW P. HUNTER

Mr. Andrew P. Hunter is the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics. As the U.S. Air Force's Service Acquisition Executive, Mr. Hunter is responsible for and oversees Air Force research, development and acquisition activities totaling an annual budget in excess of $60 billion for more than 550 acquisition programs. In this position, Mr. Hunter serves as the principal adviser to the Secretary of the Air Force and the Chief of Staff of the Air Force for research and development, test, production and modernization efforts within the Air Force.

Prior to his current position, Mr. Hunter was a senior fellow in the International Security Program and Director of the Defense-Industrial Initiatives Group at the Center for Strategic and International Studies. He focused on issues affecting the industrial base, including emerging technologies, the defense acquisition system, defense trade and industrial policy.

Mr. Hunter previously served as a senior executive in the Department of Defense as Director of the Joint Rapid Acquisition Cell, his duties included fielding solutions to urgent operational needs and leading the work of the Warfighter-Senior Integration Group to ensure timely action on critical issues of warfighter support. Mr. Hunter served as the Chief of Staff to the Honorable Ashton B. Carter and the Honorable Frank Kendall, while each was serving as Under Secretary of Defense for Acquisition, Technology and Logistics. Additional duties while at the Defense Department included support to the Deputy's Management Action Group and examining ways to reshape acquisition statutes.

Mr. Hunter served as a Professional Staff Member of the House Armed Services Committee, leading the committee's policy staff and managing a portfolio focused on acquisition policy, the defense industrial base, technology transfers and export controls. He also served in a variety of staff positions in the House of Representatives, including Appropriations Associate for Congressman Norman D. Dicks; Military Legislative Assistant and Legislative Director for Congressman John M. Spratt Jr.; and staff member for the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China.

EDUCATION

1994, Bachelor of Arts, Social Studies, Harvard University
2001, Master of Arts, Applied Economics, The John Hopkins University

CAREER CHRONOLOGY

1. 1994 – 1999, Military Legislative Assistant and Legislative Director, Representative John M Spratt, Washington DC
2. 1999 – 2005, National Security Appropriations Associate, Representative Norm D. Dicks, Washington DC
3. 2005 – 2011, Professional Staff Member, House Armed Services Committee, Washington DC

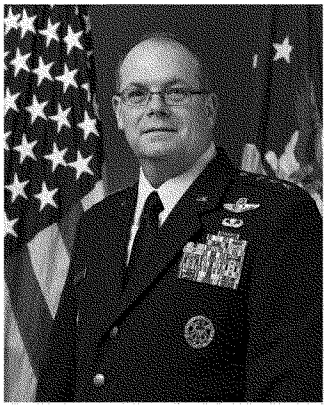
4. 2011 – 2014, Director Joint Rapid Acquisition Cell, (OUSD ATL) Department of Defense, Washington DC
5. 2014 – 2021, Director, Defense-Industrial Initiatives Group and Senior Fellow, International Security Program, Center for Strategic and International Studies (CSIS)

(CURRENT AS OF 21 JULY 2022)

BIOGRAPHY

UNITED STATES AIR FORCE

LIEUTENANT GENERAL RICHARD G. MOORE JR.



Lt. Gen. Richard G. Moore, Jr. is the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, the Pentagon, Arlington, Virginia. As the Air Force's senior planner/programmer, he directs and coordinates activities ensuring the Air Force plans for, builds, and employs effective air and cyber forces to achieve national defense objectives. To accomplish these tasks, he leads the development, integration, evaluation, and analysis of the Air Force's program objective memorandum and resource allocation plan.

Lt. Gen. Moore graduated from the U.S. Air Force Academy in 1992 with a Bachelor of Science Degree in Chemistry and subsequently earned a Master of Engineering Management Degree from Washington State University in 1997. During his Air Force career, Lt. Gen. Moore has commanded at the squadron, group and wing levels. He is a command pilot with more than 4,000 hours in the KC-135R/T Stratotanker, C-12F Huron, C- 5A/B/M Galaxy, C-17A Globemaster III and C-130J Super Hercules.

Prior to his current position, Lt. Gen. Moore was the Director of Programs, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, the Pentagon, Arlington, Virginia.

EDUCATION

1992 Bachelor of Science, Chemistry, U.S. Air Force Academy, Colorado Springs, Colo.
1997 Master of Engineering Management, Washington State University, Pullman, Wash.
1997 Squadron Officer School, Maxwell Air Force Base, Ala.
2004 Master of Military Operational Art and Science, Air Command and Staff College, Maxwell AFB, Ala.
2010 Master of Science, International Security Studies, Air War College, Maxwell AFB, Ala.
2016 Advanced Senior Leader Development Program, Warrenton, Va.

ASSIGNMENTS OR CAREER CHRONOLOGY

1. August 1992-December 1993, Student, Euro-NATO Joint Jet Pilot Training, Sheppard Air Force Base, Texas
2. December 1993-May 1997, KC-135 Aircraft Commander, Fairchild AFB, Wash.
3. June 1997-July 1998, Air Mobility Command Regional Operations Director, Tanker Airlift Control Center, Scott AFB, Ill.
4. July 1998-December 1999, Tanker Requirements Program Manager, Headquarters Air Mobility Command Directorate of Plans and Programs, Scott AFB, Ill.
5. January 2000-July 2003, C-5 Air Refueling Flight Examiner Aircraft Commander; Asst. Wing Executive Officer; Chief, Wing Exercise and Contingency Scheduling, 9th Airlift Squadron, Dover AFB, Del.
6. July 2003-June 2004, Student, Air Command and Staff College, Maxwell AFB, Ala.
7. June 2004-September 2005, Chief, Air Refueling Capabilities Branch, Global Mobility Concept of Operations Division, Headquarters U.S. Air Force, the Pentagon, Arlington, Va.

8. September 2005-August 2007, Aide-de-Camp to the Vice Chairman of the Joint Chiefs of Staff, the Joint Staff, the Pentagon, Arlington, Va.
9. August 2007-July 2009, Operations Officer and Commander, 437th Operations Support Squadron, Charleston AFB, S.C. (January 2009-May 2009, Commander, 437th Expeditionary Operations Support Squadron, Sather Air Base, Iraq)
10. July 2009-June 2010, Student, Air War College, Maxwell AFB, Ala.
11. July 2010-August 2012, Vice Commander, 62nd Airlift Wing, Joint Base Lewis-McChord, Wash. (December 2011-March 2012, Commander, 385th Air Expeditionary Group, Incirlik AB, Turkey)
12. August 2012-October 2014, Commander, 436th Airlift Wing, Dover AFB, Del.
13. October 2014-April 2015, Chief, Force Planning and Global Mobilization Division, Headquarters U.S. Air Force, Arlington, Va.
14. April 2015-July 2016, Program Integration Division Chief, Office of the Assistant Secretary of the Air Force for Financial Management and Comptroller, Headquarters U.S. Air Force, Arlington, Va.
15. August 2016-August 2018, Commander, 86th Airlift Wing, Ramstein AB, Germany
16. August 2018-June 2019, Chief of Staff, U.S. Air Forces in Europe and Air Forces Africa, Ramstein AB, Germany
17. August 2019-June 2022, Director of Programs, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, the Pentagon, Arlington, Va.
18. July 2022-present, Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, the Pentagon, Arlington, Va.

SUMMARY OF JOINT ASSIGNMENTS
1. September 2005-April 2007, Aide-de-Camp to the Vice Chairman of the Joint Chiefs of Staff, the Joint Staff, the Pentagon, Arlington, Va., as a major and lieutenant colonel

FLIGHT INFORMATION
Rating: command Pilot
Flight hours: more than 4,000
Aircraft flown: KC-135R/T, C-12F, C-5A/B/M, C-17A, C-130J

MAJOR AWARDS AND DECORATIONS
Legion of Merit with three oak leaf clusters
Defense Meritorious Service Medal
Meritorious Service Medal with four oak leaf clusters
Air Medal with oak leaf cluster
Aerial Achievement Medal with silver oak leaf cluster
Air Force Commendation Medal
Army Commendation Medal

EFFECTIVE DATES OF PROMOTION
Second Lieutenant May 27, 1992
First Lieutenant May 27, 1994
Captain May 27, 1996
Major Nov. 1, 2002
Lieutenant Colonel Dec. 1, 2006
Colonel Oct. 1, 2010
Brigadier General Aug. 5, 2016
Major General Nov. 1, 2019
Lieutenant General Jun. 30, 2022

(CURRENT AS OF JULY 2022)

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

STATEMENT OF

NICKOLAS H. GUERTIN
ASSISTANT SECRETARY OF THE NAVY
(RESEARCH, DEVELOPMENT AND ACQUISITION)

AND

LIEUTENANT GENERAL BRADFORD GERING
DEPUTY COMMANDANT FOR AVIATION

AND

REAR ADMIRAL MICHAEL DONNELLY
DIRECTOR AIR WARFARE

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

DEPARTMENT OF THE NAVY FISCAL YEAR 2025 BUDGET REQUEST FOR TACTICAL AVIATION

APRIL 16, 2024

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

Chairman Wittman, Ranking Member Norcross and distinguished members of the Subcommittee, thank you for the opportunity to appear before you today to address the Department of the Navy's Fiscal Year (FY) 2025 budget request and the state of our Tactical Aviation (TACAIR) programs.

Today's tumultuous strategic environment demands an advanced, properly trained, and effectively crewed TACAIR force equipped with superior technology. Equally important, it demands sufficient, ready, and relevant capacity to forward posture or deploy whenever and wherever necessary to ensure open and free sea lanes, deter adversary aggression, and decisively win in conflict if required. The Department's investments in 4th and 5th generation aircraft, critical munitions capacity, and advanced enabling capabilities does just that. Our carrier strike groups, expeditionary strike groups, and land-based expeditionary forces require deliberate, prioritized investment choices to project power across the globe to fulfill our mandate directed in the National Defense Strategy (NDS) and in support of our Chief of Naval Operation's and Commandant of the Marine Corps priorities. Thank you to the Congress and this Committee for your support in the FY24 Authorization and Appropriation Acts and we look forward to support and oversight on the FY25 budget request.

The security of the Nation is founded on a powerful Naval Force guided by a comprehensive maritime strategy that can anticipate and adapt to an evolving geopolitical challenge around the world. Near peer power competition will undoubtedly continue to contest the global commons and threaten peace and stability across the globe. The Department continually assess these challenges, prioritizes our investments in current and future warfighting capabilities, remain innovative in our capability development approach, and seeks every opportunity to accelerate our acquisition processes to support our force design initiatives. Our investment strategy is focused on striking a balance between current readiness, capability modernization, and sufficient warfighting capacity to maximize our lethality, support Combatant Commanders demand for naval power, and build our critical network of Allies and Partners.

Your DON has made progress in recapitalizing Naval Aviation. Last year we delivered 60 new aircraft for the Navy and Marine Corps team, including F/A-18E/F production and ongoing procurement and fleet integration of F-35, E-2D, V-22, P-8, KC-130J, CH-53K, VH-92A, and unmanned aircraft MQ-4C and MQ-9A Medium Altitude Long Endurance (MALE). Naval Aviation is now predominantly comprised of new airframes made possible through a deliberate

strategy of evolutionary, controlled technical risk development programs. Our speed of modernization matters, and we continue to navigate the ever-evolving challenges of stabilizing the industrial base, managing risks within our supply chains, and reacting to the very real challenges presented by inflation. Our investment decisions and investment strategies remain founded on ensuring affordability and maintaining accountability to the taxpayer. As we continue to look to the future of warfare, we must continue to balance the (1) readiness and relevance of our current capabilities, (2) our long-term modernization efforts to deliver advanced capabilities, and (3) our ability to sustain the force in increasing contested environments.

The Department continues to be focused on advancing the capabilities of our current critical weapon systems while ensuring we provide operational commanders available and ready systems. Building off the principles and success of performance-to-plan (P2P) and Naval Sustainment System -Aviation (NSS-A) efforts, Naval Aviation has centered on the identification and balancing of critical benchmarks for all type/model/series in regards to Capability, Affordability, Availability, Safety, and Training. Through this intentional focus, we continue to see an increase in sustained readiness that will persist over the Future Years Defense Program (FYDP).

While we continue to emphasize all critical aspects of delivered systems, our efforts are driven by the timely delivery of needed capability to the Fleet and Fleet Marine Force. As an example, in January 2023 the F-35 Program executed its first flight in the Technology Refresh (TR)-3 configuration. TR-3, a combination of software and hardware, is the foundation for Block 4 modernization critical to delivering advanced warfighting capabilities necessary to counter adversaries. We continue to work through challenges presented by TR-3 development and testing and appreciate this Subcommittee's continued support and oversight. A software independent review team was established to evaluate the F-35 software architecture which provided numerous recommendations to resolve these challenges in an expeditious manner. In a continued effort to increase our 4^{th} and 5^{th} generation aircraft capabilities, we invested in the research and development of advanced sensor and Electronic Warfare (EW) capabilities such as Next Generation Jammer (NGJ) that will significantly increase our capability against adversary radar, communications, and non-traditional EW targets. Additionally, we began the test and integration of the production version of Infrared Search and Track (IRST) Block II which provides our TACAIR fleet a "beyond visual range" radio frequency-denied air-to-air kill chain.

The Department continues to modernize and transition its TACAIR fleet of the future. In January and February 2022, two F-35C squadrons, VFA-147 aboard the USS Carl Vinson and VMFA-314 aboard the USS Abraham Lincoln, trained, prepared, deployed, and operated together in the INDOPACOM AOR marking the first time the DoN deployed two F-35C squadrons concurrently.

For the Marine Corps, VMFA-225 is currently on the 15th MEU, bringing 10 F-35Bs in support of INDOPACOM. VMFA-314 is getting ready to deploy once again aboard the aircraft carrier supporting USMC TACAIR Integration with the Navy. Additionally, VMFA-242 and VMFA-121 continue to support the 31st MEU as part of the Marine Corps' Forward Deployed Naval Force efforts. Marine Aviation's TACAIR transition plan is continuing to progress with VMFA-542 recently achieving full operational capability at Marine Corps Air Station (MCAS) Cherry Point, NC earlier this month and VMFA-311 continuing its transition at MCAS Miramar, CA. Later this year VMFA-533 and VMFA-251 will receive their first aircraft at MCAS Beaufort, SC and MCAS Cherry Point, NC respectively. The end of fiscal year 2024 will mark the halfway point in Marine Aviation's transition to the F-35B/C. Although late aircraft deliveries are delaying these squadron's ability to meet IOC and FOC requirement, there is currently no impact to Global Force Management requirements, but the transition plan has no more margin and cannot absorb any additional delays.

For the Navy, in March 2023, VFA-97 will receive its final aircraft to become the first F-35C squadron to achieve 14 PAA. Earlier this year, VFA-97 completed its deployment as the third F-35C squadron to deploy with the Carrier Air Wing. Later this year we will reposition VFA-147 forward as the Navy's first FDNF squadron equipped with the F-35C. The F-35C Fleet Replacement Squadron, VFA-125, increased its aircraft inventory by eight additional aircraft in 2023 enhancing pilot throughput.

The Fiscal Year 2025 President's Budget Request

The President's FY 2025 budget provides the resources necessary to continue to implement the 2022 National Defense Strategy and build and sustain the right mix of capabilities ensuring freedom prevails in the maritime commons. In alignment with Secretary of the Navy's priorities, the budget request enables the Department to build on our readiness, capacity, and capabilities while continuing our culture of warfighting excellence and enhancing our strategic partnerships.

The DON requests $16.2 billion in FY 2025 and includes 75 fixed-wing, rotary-wing, and uncrewed aircraft to modernize our capabilities that can achieve lethal and persistent effects inside adversary weapon engagement zones. This budget funds 53 fixed-wing aircraft to include 13 F-35B and 13 F-35C Lightning II strike fighters to continue transitioning our 4th generation fighter squadron and 27 T-54A multi-engine training system aircraft. Lastly, three MQ-25 Stingrays are requested to conduct aerial refueling and Intelligence, surveillance, and reconnaissance (ISR).

The F/A-18E/F Super Hornet will remain the predominant component of the CVW through the 2030s. The service life modification (SLM) effort and capability upgrades to the equivalent of a new production Block III will maintain the tactical superiority of the F/A-18 E/F and bolster the Navy's Strike Fighter inventory into the 2030's. These ongoing SLM efforts underway at both industry sites and fleet readiness centers (FRCs), are increasing Super Hornet service life to 10,000 hours and are significantly enhancing lethality and survivability via on-board and shared high-fidelity sensor data and improved aircrew tactical decision aids.

Marine Corps' top highlights are our commitments to the modernization of our current and future fleet, weapons integration and the execution of our transition plan. Our commitment to a full Block 4 fleet will be achieved through aircraft modernizations and future procurements. We intend to incorporate future weapons capabilities into our aircraft. This will be facilitated with more flight science aircraft to help speed up weapons testing and integration. As our transition plan continues to be executed, we are investing in RDTE money into LRASM C-3 upgrades, the procurement of sixteen LRASM C-1, and the expansion TACAIR mission sets through experimentation of crewed-uncrewed teaming with F-35 and XQ-58 Valkyrie.

Continued congressional support of F-35 Block 4 modernization efforts remain critical, including modernization kits to ensure earlier lot aircraft are rapidly modified to the critical TR-3 / Block 4 configuration. These efforts complement planned TR-3 / Block 4 production aircraft and ensure the DoN Fleet has the vital capability in the necessary capacity. As directed by this Congress in NDAA FY2024, we are establishing a sub-program for Engine and Power Thermal Management modernization. This is necessary to recapture engine life for increased affordability and additional power and cooling capacity to support future mission system enhancements. We are focused on ensuring this upgrade can be retrofit to earlier lot aircraft and standardize a

common ECU configuration across all Fleet F-35 variants. Air systems modernization is also underway to support the mission systems modernization and weapons system integration efforts.

Munitions are a critical national priority. The ongoing support to Ukraine and current conflicts in the Red Sea have highlighted the importance of a resilient munitions industrial base and the need to improve capacity and replenishment throughput as we prepare for potential contingencies in the Pacific. The President's budget request maximizes funding for weapons procurement, prioritizing funding for munitions development and production. This budget makes full use of the authorities granted in the FY 2024 NDAA to streamline multiyear procurement (MYP) contracts for critical munitions in order to generate economic order quantity (EOQ) savings, increase production capacity, stabilize the demand signal to the industrial base, and enable the Department to respond quickly to future contingencies.

Summary

The DON continues to meet challenges head on with critical investments in our force structure and readiness. We persist to be ready to meet any competition to our national interest -- on the sea, under the sea, and in the air, at any time. With Congress' support, we will provide the Nation with the combat-credible, dominant naval force to keep the sea lanes open and free, deter conflict, and when called upon, decisively win our Nation's wars.

Programmatic details regarding Navy and Marine Corps capabilities are summarized in the following section.

U.S. NAVY AND MARINE CORPS TACTICAL AVIATION CAPABILITIES

TACTICAL AVIATION

Carrier Air Wing (CVW)

The striking power of the CVW remains the cornerstone of power projection capability from 11 of the world's most survivable airfields, our aircraft carriers (CVNs). The modernization of the air wing and its weapons keeps the aircraft carrier relevant through the ship's 50 year service life. Today's air wing is transitioning to a mixture of 4th and 5th generation strike fighter aircraft that continue to incorporate advanced capabilities to support the objectives of the NDS. The F-35C is replacing the early lot F/A-18E/Fs. E-2Ds, with an advanced airborne radar, networking, and aerial refueling capability are replacing the legacy E-2C. Next Generation Jammer (NGJ) pods will augment and eventually replace the legacy ALQ-99 pods on the EA-18G and provide full spectrum integrated non-kinetic effects.

The Air Wing of the Future

The Air Wing of the Future (AWOTF) refers to the evolution and composition of the CVW as it on-ramps advanced capabilities and capacity, measured at key milestones in the near, mid, and long term. The CVW is adapting and transforming from an all "crewed" to a teamed "crewed-uncrewed" force structure over the next two decades.

In the near-term, the AWOTF completes transition to the E-2D, continues transition to the CMV-22, achieves a mix of F-35C Lightning II, F/A-18E/F Block III Super Hornet strike fighters, and EA-18G Growlers, and introduces the MQ-25 Stingray unmanned air vehicle (UAV). The MQ-25 will take over the air wing's organic aerial refueling mission, extending strike range and persistence, enhancing maneuverability, and enabling all strike fighters to focus directly on delivering effects in the high-end fight. In the mid and long term, the AWOTF will deliver game-changing lethality and survivability through the Next Generation Air Dominance Fighter (F/A-XX), further development and capability integration of uncrewed systems, and continued development of jointly integrated multi-domain kill-chains.

The 2024 NDAA granted the Navy relief from the Title 10 requirement to stand up a 10th CVW by October 1, 2025 pending SECNAV submission of a report to congress analyzing potential approaches to the manning, operation, and deployment of a 10th CVW. That report is on schedule to be submitted by the end of the current fiscal year. The current CVN maintenance

schedule efficiently pairs nine CVWs to nine operational CVNs according to ship availability; 11 total CVNs with two under planned service-life maintenance. With an 11 CVN force structure, nine CVW are the optimal number of air wings for readiness, capability, and force generation.

Marine Expeditionary Unit (MEU) Aviation Combat Element (ACE)

The Marine Expeditionary Unit (MEU) is the embodiment of the Marine Air-Ground Task Force (MAGTF), providing the nation with a critical strategic capability for naval campaigning, crisis response, and contingency operations. Deployed on a 3-ship Amphibious Ready Group (ARG), Marines and Sailors leverage the maritime domain as maneuver space to posture without the constraints and restraints of access, basing, and overflight. The self-sustained and flexible ARG/MEU can swiftly transition from steady-state competition and campaigning to crisis response or high-end warfighting without external augmentation, playing a vital role in integrated deterrence, global campaigning, and reinforcing American resolve.

As a lethal, forward-deployed, sea-based expeditionary force, the ARG/MEU operates across a spectrum of military operations with a tailorable and uniquely suited complement of aircraft. The MEU's Aviation Combat Element (ACE) inventory includes the AV-8B, F-35B, MV-22B, H-1, and CH-53E/K. The F-35B, the sole 5th Generation platform designed for amphibious warfare ships and expeditionary landing fields, stands as a cornerstone of Marine Corps' modernization efforts, integral to the Stand-in Force concept, and a crucial enabler for the Joint Force. Offering strategic agility, enhanced situational awareness, and increased maneuverability in contested environments, the F-35B provides commanders with a decisive advantage. Marine Corps F-35C aircraft completed their first deployment in support of CVW efforts as part of the service's continued commitment to TACAIR integration with USN. F-35C aircraft will also deploy in support of the Unit Deployment Program along with F-35B aircraft supporting future forward deployed naval forces efforts.

The ARG/MEU team represents one of the nation's most capable crisis response tools, persistently forward deployed and ready to provide Combatant Commanders with options across the spectrum of military operations. With its complement of capable aviation platforms, the MEU ACE ensures seamless projection of power from the sea, air, and land, bolstering the ARG/MEU's organic operational mobility.

Collaborative Combat Aircraft (CCA)

The Marine Corps is a signatory to the Tri-Service CCA Vision Alignment memo and continues to coordinate with the USN to develop its MAGTF UAS Expeditionary (MUX) Family of Systems. These efforts include accelerating prototyping and experimentation of uncrewed logistics and tactical aircraft, and a system control architecture for these platforms that is Joint, common, and interoperable. To date, the Marine Corps has completed two successful XQ-58 flights, which are informing the service requirements for an eventual MUX TACAIR CCA program of record. These efforts and additional operational analysis complement the work done to date supported by both prioritized Marine Corps funding and Rapid Development Experimentation and Research resources.

Next Generation Air Dominance (NGAD)

The NGAD FoS is comprised of crewed and uncrewed tactical platforms, advanced weapons, sensors and networks to attain and maintain air superiority. F/A-XX is the strike fighter component of the NGAD FoS and is the designated replacement for the F/A-18E/F. Design maturation efforts remain on track and the program is now considered to be in a source selection environment. The Navy released a request for proposal (RFP) for a follow-on development contract in December 2023 to Boeing, Northrop Grumman, and Lockheed Martin. F/A-XX is designed from the outset to incorporate crewed and uncrewed teaming. Included in the uncrewed tactical platforms for the NGAD FoS are the family of CCA's. Navy and Marine CCA's will augment current and next generation crewed platforms with multiple lower cost, complementary capabilities to increase combat effectiveness in highly contested environments.

Strike Fighter Inventory Management (SFIM)

Strike Fighter Inventory Management (SFIM) is the process the DON uses to manage the capacity and capability required to support the CVWs. SFIM is dependent on three critical and independent factors: the depots ability to maintain and sustain the fleet; new procurement to replace or extend end-of-service life aircraft; and utilization rates required for force generation. The Department has appropriate levers in place to manage the strike fighter inventory through the combination of F-35C procurement and SLM of F/A-18E/F Block II aircraft. These tools have enabled DON to close the Strike Fighter inventory gap by 2025 and enable the DON to meet

current Global Force Management requirements, ensuring the necessary capability is available for current and future conflicts, and managing overall strike fighter inventory into the 2030's.

SLM has two phases. Phase 1 was 'SLM specification' (commenced in 2018) and extended F/A-18E/F service life from 6,000 to 7,500 flight hours. The planned 'crawl' and 'walk' phases of SLM specification continued through 4QFY2022. Phase 2 is 'Full kit SLM' and commenced 1QFY2023, which extends the airframe to 10,000 flight hours along with incorporating Block III capability upgrades, essentially matching Block III production aircraft. SLM inductions will continue across FYDP and are estimated to cost less than 1/3 of the price of a new procurement aircraft, while providing similar capabilities. SLM delivered 51 F/A-18E/F as of March 6, 2024. Currently, there are 155 planned SLM inductions across the FYDP. Once the aircraft are inducted, there is a 12-month turnaround time for all future jet inductions.

Pilot and Aircrew Shortfalls and Mitigation Strategies

The Navy's focus on recovering student pilot throughput is bearing fruit. We are projecting production at or above the annual requirement, which will continue to bring down the number of students waiting to start training. In particular, we are slightly above projected student strike pilot throughput with 106 out of a desired 98 FY 2024 graduates through the end of February and we are projecting 155 of a planned 143 FY 2024 graduates by the end of April. We remain focused on creating and maintaining conditions to ensure steady and fulsome student pilot production.

The Navy and Marine Corps are investing in talent management and producing more capable Sailors and Marines while increasing our ability to attract and retain the most talented individuals across the force. For Naval Aviation, we continue to meet all fleet requirements and are evaluating and analyzing diversity, equity, and inclusion within the Naval Aviation Enterprise. This analysis has informed our lines of effort for broadening recruitment and outreach efforts to attract underrepresented talent, as well as focusing on retention efforts to ensure the Department retains those with the qualifications needed. The DON continues to focus on retention, merit-based bonuses and incentive pay, as well as non-monetary incentives, to keep talented aviators across different levels of rank. We narrowly focus our bonuses and special pay based on specific community shortages, critical skills, and retention goals. The Department expects competition for

talent with industry will continue, requiring a robust and competitive compensation program to recruit, retain, and distribute the force.

F-35 Joint Strike Fighter

The F-35 is the core of the future fighter fleet and plays a critical role in the Navy and Marine Corps' future Distributed Maritime Operations and Expeditionary Advanced Base Operations (EABO) warfighting concepts, providing a lethal and survivable strike and sensor platform. Ship and land-based F-35Bs and F-35Cs will continue to be the backbone of the DoN air combat superiority complimenting MAGTF and strike group commanders with a dominant, multirole, 5th generation aircraft capable of projecting U.S. power, keeping pace with threats in contested scenarios, and deterring potential adversaries.

The Navy has established one Fleet Replacement Training Squadron, one operational test squadron, one developmental test squadron, two operational squadrons with a third standing up this year and have assigned five F-35Cs to the Naval Aviation Warfare Development Center (TOPGUN) to support 4th and 5th generation Fighter integration training events. Through current operations around the globe, we continue to prove the F-35's unprecedented and unmatched capabilities.

Depot activation remains critical to long-term air system affordability and availability. By executing its Global Support Solution (GSS), the F-35 Enterprise is establishing air vehicle, propulsion, and component repair facilities in the North American, European, and Asia-Pacific regions. In FY22, the Lot 15-17 contract allocated significant funds towards air vehicle and component depot capacity establishment, demonstrating the Department's commitment to this strategy. This investment will support the F-35 Joint Program Office (JPO) in delivering depot repair capacity.

The DoN continue to work through challenges presented by TR-3. We are in the final phase of integration and testing to deliver TR-3 to the warfighter. Together with my colleague Honorable Andrew Hunter, we established a software independent review team to evaluate the F-35 software architecture. The SW IRT provided several short terms and long-term recommendations we are confident in implementing and believe it will enable continued software development efficiencies for the next generation of capabilities for the F-35 to keep pace and win against a future threat. As directed by this Congress in NDAA FY2024, we are

establishing a sub-program for Engine Core Upgrade (ECU) and Power Thermal Management System (PTMS) upgrade. Establishing this new sub-program will recapture engine life for increased affordability and additional power and cooling capacity to support future mission system enhancements. We are focused on this upgrade being retrofitable to keep costs low while maintaining commonality across the fleet of F-35 variants. I am appreciative for Congressional funding in FY-22 that allowed F-135 engine enhancements, beginning the modernization efforts. Air systems modernization is also underway to support the mission systems modernization and weapons system integration efforts.

The DoN remains focused on enterprise affordability and cost reduction across the F-35 acquisition lifecycle. We continue to support the PEO on the F-35 "War on Cost" to tackle affordability challenges in new and innovative ways. In the 2023 Annual Cost Estimate (ACE), the F-35 JPO captured an additional $13.6B in sustainment cost reductions over program's lifecycle, bringing the total captured savings to date to $33.7B This results from reliability and maintainability projects, propulsion component improvement efforts, capability updates (including engine core upgrade), and workforce efficiencies driven by the National Autonomic Logistics Information System (ALIS) Support Center activation. The DoN in close coordination with the F-35 Joint Program Office has driven F-35B Cost Per Tail Per Year (CPTPY) down from $7.0M in 2020 to $5.74M in 2022 (CY12$) and for the Navy F-35C from $9.4M in 2020 to $7.5M in 2020.

The DoN remains committed to reducing F-35 costs for both production and sustainment as well as improving mission readiness. To get after readiness concerns, the DoN has incorporated the F-35 into the Naval Sustainment System-Aviation (NSS-A) ecosystem. Through the involvement of the Fleet's Maintenance Operations Cell (MOC) Aircraft on Ground (AOG) with PEO-JSF Lightning Sustainment Center, coordination of unit prioritization and allocation of DoN resources across DoN aircraft has helped reduce aircraft turnaround times and improve readiness. In March 2023, PEO-JSF set a target of increasing the U.S. fleet-wide F-35 mission capable rate by 10% (to 64%). To achieve this, the F-35 JPO assembled a team dedicated to understanding and addressing complex challenges associated with top degraders, supply and maintenance challenges, and issues affecting long-term-down and out-of-reporting aircraft. Today, our U.S. F-35 fleet mission capable rate averages 57.5% – up over 4% since Dec 2023.

Though the F-35 JPO has not hit the 64% target yet, this initiative is accelerating maturation of an ecosystem that supports the program's long-term sustainment goals.

Prior to the 2022 National Defense Authorization Act (NDAA) Section 142 (i.e., transition integrated product support elements to U.S. Service-led), the GSS was operating in a hybrid sustainment infrastructure leveraging legacy U.S. service providers, prime Industry and our International Partners and Allies. Since then, our air vehicle CONUS depot core activations began transitioning OEM repairs to all Air Logistics Centers (ALCs) and Fleet Readiness Centers (FRCs); our egress explosive devices (i.e., CAD/PADs) for Production and Sustainment are procured from U.S. service-led Indian Head; our common support equipment are procured by NAWC Lakehurst; our Heavy Air Vehicle Mod depots are provided by Ogden ALC and FRC-E; our North America warehouse is provided by DLA and our global transportation is now provided by U.S. Transportation Command (USTC). As the U.S. services codify NDAA 142 requirements, we will continue to add U.S. service-led capability to the GSS infrastructure. These capabilities, complemented by our forward-positioned global footprint of Partner/FMS depots and regional warehousing, helps deliver the integrated deterrence doctrine of the National Defense Strategy.

The Marine Corps Program of Record (POR) for F-35 is 420. Marine Aviation remains fully committed to the F-35 and is continuing with the transition to an all-F35 5th Generation TACAIR force, in line with Commandant's Force Design guidance. The updated Force Design TACAIR Transition Plans call for a Primary Aircraft Authorization (PAA) for 18 squadrons of 12 aircraft which supports all MEU, Unit Deployment Program, Tactical Aviation Integration (TAI), and Combatant Command (COCOM) Global Force Management requirements at a 1:3 deployment to dwell. This 12 aircraft squadron construct allows the Marine Corps the flexibility to tailor deployments to theater commander requirements, while adjusting to a pacing threat.

The Marine Corps has established two Fleet Replacement Squadrons, one operational test squadron, and nine operational line squadrons deploying regularly with two additional line squadron activations occurring this summer. Building on relationships strengthened during the service's partnership with the United Kingdom aboard HMS *Queen Elizabeth* and with Japan aboard JS *Izumo*, the Marine Corps continues to work with our allies to enhance flexibility and lethality through operations from multiple allied partnerships.

The tactical unit of employment coupled with sortie generation rates have driven the squadron composition to adjust to 12 jets. Commanders retain the flexibility to deploy 10-12 F-35Bs aboard our MEUs compared to the traditional six AV-8B ACE contingent; offering the COCOMs a 66 percent increase in TACAIR – 5th Generation aircraft – with our MEUs. F-35C squadrons will fill both UDP (land-based) and TAI (aircraft carrier) deployments with a full complement of 12 aircraft. The change from 10 to 12 PAA has been analyzed in depth and can be supported without adjusting the POR of 420 aircraft.

Beginning in PB26, Marine Aviation will change its F-35B/C mix to 12x F-35B squadrons and 6x F-35C squadrons. This is not a change to the POR number, but rather an adjustment to the mix between types. Instead of the previous numbers of 353 F-35Bs and 67 F-35Cs, Marine Aviation will adjust procurement to 310 F-35Bs and 110 F-35Cs in support of Force Design. The final two active component transitioning squadrons (VMFA-323 and VMFA-232) will transition to the F-35C instead of the F-35B.

TR-3 and block 4 capability development schedule and cost remain a concern for the Marine Corps. Specifically, weapons integration timelines need to be maintained. We are working closely with the JPO and other services to ensure vital weapons capabilities are delivered to the fleet on an acceptable timeline and without unacceptable cost growth.

Both F135 and PTMS upgrades are necessary to meet future capability enhancements and reduce future sustainment costs. As the F-35 continues to see upgrades in its mission systems capabilities, the requirement for increased cooling capacity continues to grow to ensure lethality for the remainder of its expected service life. The Marine Corps is aligned with the Air Force and the Navy in prioritizing the ECU and PTMS upgrade. The service intends to invest over $600M in development across the FY25 FYDP. The ECU upgrade will drive down lifetime engine sustainment costs by reducing the total overhauls required during the program's life.

The DoN maintains its commitment to reducing F-35 costs for both production and sustainment while also enhancing mission readiness. The F-35 program is advancing towards a supply chain with a demand-reduction Performance Based Logistics (PBL) contract, aiming to prioritize availability and affordability outcomes across the F-35 enterprise. In alignment with recent congressional direction, the DoN is collaborating with the program office to assume greater management, planning, and execution responsibilities for F-35 sustainment functions which hold the potential to further reduce sustainment costs.

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

Service Life Extension Program (SLEP), High Flight Hour (HFH), and Center Barrel Replacement (CBR+) efforts extend the F/A-18C/D beyond its original service life of 6,000 hours, to 8,000 hours. Additional service life extension authorizations extend service life to 9,000 hours, and up to 10,000 hours for select aircraft. Eight aircraft were inducted for HFH and/or CBR+ and included SLEP modifications in FY 2023, with 19 aircraft planned for delivery in FY 2024. Along with flight hour extensions, these aircraft require capability upgrades to their radars, radios, electronic warfare suites, software and avionics systems to maintain lethality, survivability, and availability to meet the documented Marine Corps requirement for tactical aircraft that can support the NDS and National Military Strategy through 2030. It also includes the implementation of the Automated Ground Collision Avoidance System (Auto-GCAS) to mitigate Controlled Flight into Terrain (CFIT) and has consistently been a top platform safety priority in Naval Aviation readiness groups, operational advisory groups and the systems safety working groups. The Embedded National Tactical Receiver will be installed in these aircraft that will enable them to receive Integrated Broadcast Service. This service provides beyond line of sight reception of intelligence information. These capability requirements enable the Marine Corps to operate the F/A-18C/D through FY 2030 while supporting the TACAIR transition to F-35B/C.

The FY 2025 President's Budget requests $116.6 million in APN for F/A-18C/D. This includes funding to implement aircraft commonality programs, improve reliability, and ensure structural safety of the F/A-18C/D inventory, and funds the continuation of Hornet capability enhancements.

F/A-18E/F Super Hornet

The F/A-18E/F Super Hornet is a 4th generation multi-mission aircraft serving as the predominant strike-fighter in the CVW into the 2030s. On March 19, 2024, 17 F/A-18E/F Block III aircraft were placed on contract with Boeing with the final F/A-18E/F scheduled to deliver in FY 2027. This contract also procures critical technical data absolutely necessary for the Navy to organically maintain the F/A-18E/F after the production line shuts down.

In tandem with these Block III deliveries, SLM initiatives and capability upgrades enhance our inventory by maintaining the tactical relevance of the F/A18 E/F. IRST Block II, is in flight

testing and on track to declare initial operating capability (IOC) in 4QFY2024, bringing critical out-of-band detection and weapon-quality-track capability against advanced air threats. Super Hornet continues to integrate new capability in support of joint warfighting capability, to include beyond line-of-sight communications and Open Mission Systems architecture and MUM-T in support of NGAD and the AWOTF.

The FY 2025 President's Budget requests $1.3 billion of APN for F/A-18 E/F and EA-18G modernization and sustainment, IRST, and F/A-18 series. Additionally, the budget requests $122.7 million of APN for installation costs associated with the delivery of F/A-18 E/F/G aircraft. Finally, the FY 2025 budget requests $358.5 million of RDT&E for improvements, radar upgrades and advanced aircraft system capabilities. This funding is critical to develop and sustain the warfighting capabilities of the Navy's predominant carrier aviation platform.

AV-8B Harrier

The AV-8B Harrier program is critical to the Marine Corps' transition to F-35B. The platform has completed upgrades to enhance lethality, increase readiness, and improve supply chain asset management. The program executed the development of final fit capabilities, including Sidewinder Air-Intercept Missile (AIM-9X) integration, expanded Joint Standoff Weapon (JSOW) and Joint Direct Attack Munition (JDAM) capabilities, and enhanced Link-16 functionality. These functionalities enable the platform to be relevant for operational deployments through fiscal year 2026.

The FY 2024 budget request continues a time-phased budget transition from investment accounts toward Operations and Maintenance to support platform sustainment during sundown. $8.3 million in RDT&E funds continue the design, development, integration, and testing of Operational Flight Program upgrades, weapons integration improvements, flight test requirements, and safety and reliability improvements to the airframe and engine to mitigate obsolescence issues. $22.8 million in APN continues the incorporation of Obsolescence Replacement/Readiness Management Plan systems, electrical and structural enhancements, LITENING Pod upgrades, engine safety, digital interoperability updates that include Link-16 systems, and inventory sustainment upgrade efforts to offset obsolescence and attrition.

AIRBORNE ELECTRONIC ATTACK (AEA)

EA-18G Growler

The EA-18G Growler is a critical enabler for the Joint force, bringing fully netted electronic warfare capabilities to the fight and providing essential capabilities in the electromagnetic maneuver warfare environment. The FY 2025 budget retains and fully funds the EA-18G aircraft and squadrons across the FYDP. Along with the electronic attack suite, the Growler also features the APG-79 Active Electronically Scanned Array (AESA) radar. Growler integrates the latest electronic attack technology, including the ALQ-218 receiver, jamming pods, communication countermeasures, and satellite communications. The Growler Capability Modification (GCM) Program, the first major effort to upgrade EA-18G capabilities in the history of the program, commenced at Naval Air Station Whidbey Island, Washington, in March 2021. Thus far, 40 aircraft have completed the modification, bringing this capability to five squadrons across the fleet.

Growler Block 2 (GB2) will deliver capabilities to the warfighter to detect, locate, identify and counter advance integrated air defense systems (IADS) and complex emitters. GB2 utilizes a phased approach for continued spiral development of AEA capabilities to modernize processing, sensors and aircrew decision aids to maintain dominance in the modern electromagnetic spectrum. Phase 1 will include an upgraded Next Generation Electronic Attack Unit with open mission systems architecture, multi-level security, and incorporation of the Reactive Electronic Attack Measures capability. Phase 2 is the addition of the Beowulf advanced multi-function array into the inboard leading-edge flaps of the aircraft, augmenting the ALQ-218 functionality and capability. GB2 serves as a critical technology development and risk reduction effort to support Naval Aviation's AWOTF.

NEXT GENERATION JAMMER

NGJ is the evolution of electronic warfare capability to counter the adversary electromagnetic spectrum threat. NGJ pods will augment and eventually replace the legacy ALQ-99 pods on the EA-18G and provide full spectrum integrated non-kinetic effects. The delivery of NGJ Mid-Band (MB) increases EA-18G Growler's lethality today providing a multi-generational leap in capability against adversary radars and communication targets utilizing advanced EA techniques as well as improved reliability and maintainability over legacy ALQ systems. NGJ is

phased by threat, with initial focus on mid-band spectrum capability, followed in the future by Low-Band (LB). NGJ High Band remains unfunded.

NGJ-MB is a cooperative development and production program with Australia, with two pods comprising a single shipset. A full rate production decision is expected in 3QFY2024. Three LRIP I shipsets were delivered in FY 2023. The first LRIP II shipset was delivered in 2QFY2024 with the remaining four LRIP II shipsets planned for delivery in FY 2024. Upon conclusion of operational test, IOC and initial deployment will occur this FY. The FY 2025 budget includes $86.7 million in RDT&E funding to continue development of the NGJ-MB Extended (MBX) engineering change proposal (ECP) to extend the upper frequency range coverage limit of the system to counter modern and adaptive threats with initial deliveries planned for FY 2028. The FY 2025 budget request also includes $453.2 million in APN-5 funding for ten Lot 5 shipsets, associated support equipment, training equipment and production support.

NGJ-LB is also a cooperative development program with Australia and represents AEA capability improvement to augment and replace the legacy ALQ-99 Tactical Jamming System in low frequency bands where modern adversary radars have proliferated posing significant threats to joint forces. The FY 2025 budget request $209.6 million RDT&E for NGJ-LB to focus on pod design, advanced capabilities development, and the build of aeromechanical and mission systems test pods to support ground and flight testing.

INTREPID TIGER II

The Marine Corps, through the INTREPID TIGER II program, is bringing advanced Electronic Warfare (EW) to all its aviation platforms, and is focused on crewed-uncrewed teaming to answer the MAGTF's requirements for AEA. The Marine Corps has worked in conjunction with OSD to purchase the first two XQ-58 Valkyrie CCA platforms to test EW effects in partnership with F-35 and our Assault Support platforms.

WEAPONS PROGRAMS

The FY 2025 President's Budget request invests $6.6 billion in critical Navy munitions and builds off of FY 2023 and FY 2024 weapons industrial base and procurement investments. We continue to work with industry to identify manufacturing challenges and provide investment opportunities to streamline testing and increase production. The Navy is investing funds in both industry and its

organic industrial base to ensure we can ramp up production in the immediate future. The FY 2025 budget request protects investment in critical munitions via investment in the industrial base, specifically through multi-year purchases. The budget prioritizes procurement of Tomahawk, Long Range Anti-Ship Missile (LRASM), Advanced Anti-Radiation Guided Missile Extended-Range (AARGM-ER), Sidewinder Air-Intercept Missile (AIM-9X), Advanced Medium-Range Air-to-Air Missile (AMRAAM), Small Diameter Bomb II (SDB II), Rotary Wing Long Range Attack Missile (LRAM), Joint Direct Attack Munitions (JDAM) kits and General Purpose Bombs (GPB). The Navy welcomes and appreciates supplemental funding requests to help replenish munitions provided in support of Ukraine and expended in the Red Sea.

Munitions Inventory and Industrial Base

The DON is working closely with industry to expedite replenishment of stocks provided to Ukraine, engaging with industry partners to understand the barriers to accelerating production and determine how and where the Department can make strategic investments to improve inventory, capability, and capacity. The Department is investing in the industrial base to expand and accelerate production throughput, streamline testing, and strengthen critical component suppliers. Simultaneously, the Department is placing investments into recertification as a cost-effective way to improve near-term inventories. Coupled with the ongoing replenishment of Navy stocks, these investments into the munitions industrial base send the demand signal that building munitions inventories is a top priority.

The DON is leveraging the authorities granted in the FY 2024 NDAA to pursue MYP contracts for critical munitions programs. MYP contracts for AMRAAM and LRASM will be joint efforts with the USAF. Increased procurement budgets in the President's Budget 2025 seek to capitalize on these investments to further build critical munitions inventories and accelerate fielding of emerging technologies to fleet squadrons. This strategy allows the Department to use savings generated through the use of EOQ financing to procure additional missiles under a buy-to-budget concept, further improving efficiencies and yields.

Offensive Anti-Surface Warfare (OASuW) Increment 1/ LRASM C-1/C-3 and OASuW Increment 2 / Hypersonic Air Launched OASuW (HALO)

The LRASM C-1 and C-3 variants add near-term, cost-effective capacity to the DON's long range strike capability while enhancing the OASuW mission. The FY 2025 President's Budget requests $102.5 million in procurement funding to buy 30 DON LRASM C-1 weapon systems with associated support and complete operational test for the C-1 configuration. The FY 2025 President's Budget request also includes $163.2 million in RDT&E funding for the continuing development of the LRASM C-3 capability improvement. Navy AGM-158 development efforts involve integration of a beyond line-of-sight radio subsystem to enable enhanced operational flexibility.

The FY 2025 President's Budget continues developing the AGM-158 C-3 variant through software development and test, platform integration, and entry into integrated test. The FY 2025 President's Budget request also includes $223.9 million for procurement of 60 LRASM in the C-3 configuration migrating the primary production line to the more-capable C-3 configuration as the program reaches sufficient maturity.

The FY 2025 President's Budget includes $178.6 million for development of OASuW Increment 2, which is now referred to HALO. HALO supports the national imperative to mature hypersonic capabilities and transition them into warfighting systems, increasing the lethality and deterrent effect of our air carrier wings. The program represents a longer-term capability that encompasses increased performance and will provide the Navy with the necessary air-launched, carrier-based weapon to address evolving long range high speed threats from peer and near peer competitors. HALO will complete Milestone B and enter formal engineering and manufacturing development, to include a competitive contract award during FY 2025.

AARGM & AARGM-ER

AARGM domestic procurement completed in FY 2021 with the award of the last DON full rate production (FRP) contract. There have been 1450 AARGMs (all up rounds (AUR), training missiles, and spares) delivered to the fleet as of March 2024. Program of record delivery is 1803 missiles. Deliveries continue through FY 2025 in support of the transition to AARGM-ER. AARGM-ER provides the DON with a 5th generation compatible extended range asset to project power and provide suppression of enemy air defenses (SEAD), both at-sea and on land. The first

AARGM-ER delivery is scheduled for 3QFY2024. The FY 2025 President's Budget requests $22.3 million in RDT&E to support operational and integrated flight testing of production representative hardware. The budget requests $248.6 million in Weapons Procurement, Navy (WPN) to procure 151 AARGM-ER AURs, six captive air training missiles (CATM) and advanced procurement.

AIM-9X

The AIM-9X (Sidewinder) missile is a datalink-enabled, launch and leave, air combat munition that uses passive infrared energy to acquire and track enemy air targets. The FY 2025 budget requests $31.4 million in RDT&E that will be applied to development of hardware and software to improve performance against evolving threat platforms and countermeasures. The budget also includes $86 million in WPN funding to procure a combined 116 AURs and 41 CATM's and associated missile/trainer related hardware.

AMRAAM/AIM-120D

The AMRAAM program provides for the acquisition and upgrade of the Department's advanced all-weather, all-environment medium range air-to-air missile system. AMRAAM, a joint program with the U.S. Air Force, provides for a more lethal naval fighting force capable of continued maritime dominance and power projection, while also supporting the North Atlantic Treaty Organization and 43 allied countries.

The FY 2025 budget request maximizes AMRAAM production capacity and completes USN procurement requirements within the FYDP. The DON is leveraging the authorities granted in the FY 2023 NDAA to pursue MYP contracts for critical munitions. The strategy allows the DON to use savings generated through the use of EOQ financing to procure additional lots of missiles under a buy-to-budget concept and improve warfighting readiness, stabilize the defense supply base with predictable production. The program is working with the Department of Defense to layout a MYP strategy with the USAF as the lead. The FY 2025 budget includes $29.6 million in RDT&E to further develop software capability enhancements to counter emerging threats as well as test and evaluation activities that support fleet release of system improvement program (SIP) efforts. The budget also includes $279.6 million in WPN funding to procure 261 AURs and associated missile/trainer related hardware. AMRAAM WPN and RDT&E funding directly

supports the Pacific Deterrence Initiative by increasing joint force lethality through increased missile inventory and weapon effectiveness.

Small Diameter Bomb II (SDB II)

Small Diameter Bomb Increment II (SDB II) is an Air Force led, joint program that provides the warfighter a capability to attack mobile targets in all weather conditions from stand-off range. The FY 2025 budget requests $19.7 million in RDT&E for continued development and test of the SDB II weapon, F-35 developmental testing and integration, Boeing BRU-61 integration and support for integration of BRU-55 racks on F-18 stations. Early operational capability fielding was approved for the F/A-18E/F on 3 October 2023 and with F-35C planned for 1QFY 2025. The DON also requests $76.1 million in WPN funding to procure 280 AURs.

Rotary Wing Long Range Attack Missile (LRAM)

In order to address capability gaps inherent in its rotary wing and future vertical takeoff and landing (VTOL) systems, the Marine Corps requests RDTEN funding in FY 2025 to further develop a long-range, precision guided munition capable of engaging mobile land and maritime targets from standoff ranges greater than 150 nautical miles. This munition will enable the Marine Corps' extensive rotary wing fleet, and future VTOL aircraft, to deliver precision effects from standoff ranges and expeditionary air sites in collaboration with 5th generation aircraft and network-enabled targeting sources. The FY 2025 President's Budget requests $20.3 million in RDTEN to transition the LRAM project from a Defense Innovation Acceleration (formerly Joint Capability Technology Demonstration) project to a formal Program of Record capable of fielding operational missiles to the Marine Corps' rotary wing fleet in FY 2027.

Direct Attack Weapons and General Purpose Bombs

Fully funding the GPB and JDAM line items is critical to building and maintaining the Navy's direct attack weapons inventory. The FY 2025 budget requests $33.2 million for GPB's, $75.1 million to procure 1,460 SABR-M(V3) JDAM kits, and $56.7 million for more affordable practice bombs to enhance readiness and prepare for future contingencies.

DEPOT MAINTENANCE

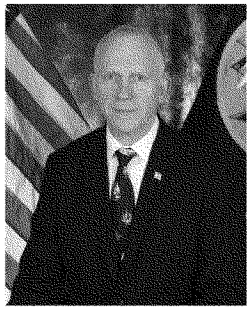
The FRCs perform a vital role in national defense by executing maintenance, repair, overhaul, and upgrades (MRO&U) on aircraft, engines, and components, providing combat-ready weapons systems to the fleet. The FRCs' infrastructure consists primarily of World War II and Vietnam era facilities in need of major upgrades and reconfiguration in order to support aviation readiness. The FRC Infrastructure Optimization and Modernization Plan (FIOP) was developed to guide strategic investments in infrastructure improvements, while including advanced technology opportunities, optimization of workflow, and environmental and energy resiliency. When fully executed, FIOP will deliver required maintenance hangar repairs and upgrades to support current and next generation aviation weapons systems, optimize workflow within the depots through significant configuration changes to their physical layout, and recapitalize obsolete industrial plant equipment with modern technology that will substantially increase productivity and safety.

In the last five years, the DON has procured more than 330 industrial equipment assets with modern interfaces and globally recognized standards with continued construction on: the F-35B Vertical Lift Fan Test Facility, Fleet Readiness Center East (FRCE), MCAS Cherry Point, NC; the Aircraft Paint Complex, Fleet Readiness Center Southwest (FRCSW), NAS North Island, CA; broke ground on a CMV-22 maintenance hangar at FRCSW, NAS North Island, CA; constructed the Targeting and Surveillance Systems Facility, Fleet Readiness Center Southeast (FRCSE), NAS Jacksonville, FL; design and continued efforts for the F135 Engine Test Cell Facility Modification design at FRCSE, NAS Jacksonville, FL. Additionally, established a public-public partnership between the Navy and the State of North Carolina's Global TransPark (GTP) Authority to construct a $350M MRO&U facility in support of FRCE mission and workforce with no Navy or DoD funding.

The Navy has instituted an acquisition program-equivalent measure of oversight for FIOP to provide DON leadership the ability to effectively and efficiently meet industrial sustainment goals. The FY 2025 budget requests approximately $407 million in support of increasing aviation weapons systems maintenance throughput. The PB25 request of $2.3 billon across the FYDP continues supporting the reconstitution of facilities, infrastructure, and recapitalization of obsolete and degraded industrial support equipment critical to meeting depot production requirements.

United States Navy
Biography

The Honorable Nickolas H. Guertin
Assistant Secretary of the Navy for Research, Development, and Acquisition



Nickolas H. Guertin was sworn in as Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN RD&A) on December 20, 2023. A Presidential appointee confirmed by the United States Senate, he leads the Department of the Navy's (DON) Research, Development, Acquisition, and Sustainment programs and the DON's contracting community. Prior to this role, Mr. Guertin served as the senior advisor to the Secretary of Defense on operational and live fire test and evaluation of Department of Defense weapon systems (Director, Operational Test and Evaluation).

Mr. Guertin has an extensive four-decade combined military and civilian career in submarine operations; ship construction and maintenance; development and testing of weapons, sensors, combat management products including the improvement of systems engineering; and defense acquisition. Most recently, he has performed applied research for government and academia in software-reliant and cyber-physical systems at Carnegie Mellon University's Software Engineering Institute.

Over his career, he has led organizational transformation, improved competition, and increased application of modular open-system approaches, prototyping, and experimentation. He has also researched and published extensively on software-reliant system design, testing, and acquisition. He received a Bachelor of Science in Mechanical Engineering from the University of Washington and an MBA from Bryant University. He is a retired Navy Reserve Engineering Duty Officer, was Defense Acquisition Workforce Improvement Act (DAWIA) certified in Program Management and Engineering, and is a licensed Professional Engineer (Mechanical).

Rear Admiral Michael Donnelly

Director, Air Warfare Division, N98, Office of the Chief of Naval Operations

Rear Adm. Michael "Buzz" Donnelly is a native of Kent Island, Maryland. He is a 1989 graduate of Villanova University and was commissioned via the Naval Reserve Officer Training Corps. He is also a 2002 graduate of the Naval War College in Newport, Rhode Island.

As a naval flight officer, Donnelly made deployments flying the F-14A/B/D Tomcat and F/A-18F Super Hornet. He served as commanding officer for Strike Fighter Squadron 154 (VFA-154); the last commanding officer of USS DENVER (LPD 9) forward deployed to Sasebo, Japan; commanding officer of USS RONALD REAGAN (CVN 76) forward deployed to Yokosuka, Japan and commander of Task Force SEVEN ZERO / Carrier Strike Group FIVE permanently embarked onboard USS RONALD REAGAN (CVN 76).

Ashore, Donnelly served on the International Military Staff at NATO Headquarters in Brussels, Belgium, and two tours with the Air Warfare Directorate (N88/N98), OPNAV Staff, Pentagon, as Naval Aviation's F/A-18 Requirements officer and as Aircraft Carrier Requirements branch head. He also served as the 37th commander of U.S. Naval Forces Korea and Commander, Navy Region Korea. Donnelly assumed the duties of Director, Air Warfare (N98), OPNAV Staff, Pentagon on 4 August 2023.

Lieutenant General Bradford J. Gering

DEPUTY COMMANDANT FOR AVIATION

Lieutenant General Gering assumed the duties of Deputy Commandant for Aviation in February 2024.

A native of Smithtown, New York, he graduated Binghamton University and was commissioned via the Platoon Leaders Class program in May 1989. Following The Basic School, he completed flight training and was designated an AV-8B Harrier pilot.

As a general officer, he commanded I Marine Expeditionary Force and 3rd Marine Aircraft Wing. His staff assignments include Deputy Director J3, United States Africa Command, Assistant Deputy Commandant for Aviation, Deputy Commander, U.S. Marine Corps Forces Command, and Deputy Commanding General, Fleet Marine Forces Atlantic.

At the squadron level, Lieutenant General Gering commanded Marine Attack Squadron 211 and Marine Aviation Weapons and Tactics Squadron 1.

He served in the operating forces with Marine Attack Squadron 311, Marine Medium Helicopter Squadron 268 (Reinforced) 15th Marine Expeditionary Unit (Special Operations Capable), Marine Medium Helicopter Squadron 161 (Reinforced) 15th Marine Expeditionary Unit (Special Operations Capable), Marine Attack Squadron 214, III Marine Expeditionary Force Special Operations Training Group, and Joint Task Force 536. He has participated in Operations SOUTHERN WATCH, IRAQI FREEDOM I, UNIFIED ASSISTANCE, and IRAQI FREEDOM 05-07.

Lieutenant General Gering's staff tours include AV-8B Harrier Instructor with Marine Aviation Weapons and Tactics Squadron 1, Aviation Lieutenant Colonel's Monitor and Aviation Assignments Section Head with HQMC Manpower and Reserve Affairs, Global Force Management Plans Officer with the Office of the Secretary of Defense (Personnel and Readiness) and Marine Military Assistant to the Secretary of the Navy.

Lieutenant General Gering is a graduate of The Basic School, Weapons and Tactics Instructor Course, Amphibious Warfare School, Marine Corps Command and Staff College, and the National War College. He holds a BA in Psychology and History from Binghamton University and a MS in National Security Strategy from the National Defense University.

His personal decorations include the Defense Superior Service Medal with Oak Cluster, Legion of Merit with Gold Star, Bronze Star Medal, Meritorious Service Medal with 3 Gold Stars, Air Medal with Combat V and Numeral 8, Joint Service Commendation Medal, Navy and Marine Corps Commendation Medal with Gold Star, and the Navy and Marine Corps Achievement Medal with 3 Gold Stars.

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THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT OF
LIEUTENANT GENERAL MICHAEL SCHMIDT
PROGRAM EXECUTIVE OFFICER
F-35 LIGHTNING II PROGRAM

BEFORE THE
TACTICAL AIR AND LAND FORCES SUBCOMMITTEE OF THE
HOUSE ARMED SERVICES COMMITTEE

ON
FISCAL YEAR 2025 BUDGET REQUEST OF THE DEPARTMENT OF DEFENSE FOR
FIXED-WING TACTICAL AND TRAINING AIRCRAFT PROGRAMS

16 APRIL 2024

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THE HOUSE ARMED SERVICES COMMITTEE

INTRODUCTION

Chairman Wittman, Ranking Member Norcross, and distinguished Members of the subcommittee, thank you for the opportunity to provide an F-35 Program update. In December 2023, I testified before this subcommittee on topics spanning F-35 development, production, and sustainment. The subcommittee highlighted priorities including engine power and cooling modernization, test infrastructure enhancements, digital engineering initiatives, supply chain maturity, the program's future sustainment strategy, Technology Refresh 3 (TR-3), and Block 4 delivery. As you know, development and production concurrency is Block 4's most critical challenge, and we are dealing with its consequences today. Since my last testimony, the F-35 Joint Program Office has maintained unequivocal focus on these efforts as we work to make congressional and warfighter expectations a reality. I look forward to offering updates regarding progress across these fronts, and to sharing details on the work that remains.

Amid these efforts, the Department of Defense's official declaration of Milestone C and formal Full Rate Production decision in March 2024 gives credence to the acquisition maturity taking place within the F-35 Enterprise. For over twenty years, F-35 stakeholders have laid the groundwork for a 5th Generation Air System that is operating around the world today--and planned for employment by U.S. and international users for decades to come. With this milestone behind us, we enter a new chapter as we make an unrelenting push to modernize this platform for the future and drive sustainment excellence throughout the fleet. TR-3, a Reimagined Block 4, propulsion modernization, and the upgrades that will follow, depend on the work we must execute today. The F-35 Program represents professional acquisition at its highest level – and I'm tremendously proud of the team working to bring these objectives to life. As this subcommittee knows, the efforts that got us here will not be sufficient to get us where we are going. Success will

continue to require the best personnel, software practices, facilities, supply chains, and industry partnerships our U.S. and international teammates can offer. I have no doubt we will continue to face and overcome complex challenges, and I assure you the F-35 Joint Program Office team remains up for the challenge.

Program Progress

In the brief time since I last testified before this subcommittee, F-35 U.S. and international stakeholders made significant progress. In December, South Korea announced the purchase of twenty F-35As, in addition to forty jets the nation already received. In the same month, Australia signed stage two of a facility services deed enabling construction of seven additional maintenance bay facilities in the country's Hunter Valley. Meanwhile, the F-35 JPO and Naval Information Warfare Center Atlantic delivered the first Government Furnished Equipment Operational Data Integrated Network (ODIN) Country Kit to Lockheed Martin for software integration and testing. This innovation addresses Autonomic Logistics Information System (ALIS) hardware obsolescence and accelerates technology insertion to improve readiness.

In January, The Netherlands declared initial depot capability for a sovereign F-35 Maintenance, Repair, Overhaul, and Upgrade (MRO&U) facility at Woensdrecht Air Force Base. In Japan, the Mizuho Regional Engine MRO&U facility declared initial depot capability for F135 power modules. From an operational perspective, the Royal Norwegian Air Force successfully deployed F-35s to Iceland as part of NATO air surveillance missions in the region. Meanwhile, U.S., United Kingdom, and Australian team members participated in Red Flag exercises at Nellis Air Force Base, where users experienced realistic, high-end combat scenarios. In late January, personnel from the Vermont Air National Guard's 158th Fighter Wing traveled to Savannah Air

National Guard Base for an Agile Combat Employment exercise known as *Maple Thunder*. On 29 January, the Czech Republic finalized an agreement to procure twenty-four F-35A aircraft, making the nation the F-35 Program's tenth Foreign Military Sales customer. That same month, the Department of Defense concluded its F-35 Technical Baseline Review by providing findings associated with Block 4 schedule, hardware maturity, software, and workforce considerations. Joint Program Office personnel are implementing many associated findings as we work to drive cost, schedule, and performance rigor throughout Block 4 development and delivery.

In February, F-35 stakeholders gathered for a Corrosion Summit where team members identified new corrosion prevention initiatives to maximize mission capability across the fleet. During the same month, F-35 suppliers delivered the 3,000th Gen III Helmet Mounted Display System. Meanwhile, U.S. Marine Fighter Attack Squadron 121 deployed aboard USS America, and the U.S. Air Force's 48th Fighter Wing unveiled a new training facility at Royal Air Force Lakenheath, United Kingdom. As operational activities continue, fleet availability remains a top enterprise priority. Since our War on Readiness began, mission capable rates have increased, but not enough. For several days in February, the fleet's mission capable rate clocked in at 64.2%. While surges in readiness offer a glimpse of what's possible in the months ahead, our focus remains on elevating readiness rates for years, not just months and days. Later in February, U.S. Air Force 4th Fighter Squadron F-35As assigned to Hill Air Force Base participated in combined training with the U.S. 7th Air Force and Republic of Korea Air Force fighter aircraft during a temporary deployment to Osan Air Base, Korea.

March 2024 was one of the most significant months in F-35 acquisition history. The Director, Operational Test and Evaluation (DOT&E) released the formal F-35 Initial Operational Test and Evaluation (IOT&E) report, which evaluated F-35 combat effectiveness against current

and future threats and assessed the fleet's sustainment posture. Meanwhile, the F-35 demonstrated its capability throughout the month at *Nordic Response*, a large-scale field exercise in Finland, Norway, and Sweden. 20,000 warfighters from 13 countries including Norway, Finland, Germany, Sweden, the UK, and the U.S. engaged in training activities. The U.S. Marine Corps, Royal Air Force, Royal Navy, and Royal Norwegian Air Force deployed F-35s during the exercise. Also in March, the F-35 JPO awarded a contract modification extending the existing FY23 recurring sustainment contract period of performance through 30 June. Several weeks later, U.S. and international leaders gathered in Washington, D.C. for a semiannual JSF Executive Steering Board (JESB) meeting. The same week, Air Combat Command completed its first ever F-35A Nuclear Weapon System Evaluation Program by successfully dropping two Joint Test Assemblies. As the month came to an end, we reached an out-of-court settlement with Lockheed Martin in ongoing litigation concerning an intellectual property dispute centered on "F-35 In a Box" software. After nearly five years of litigation, the agreement enables future F-35 In a Box deliveries and opens the door to Government software development opportunities in key program areas. This also enables the Joint Simulation Environment (JSE) to support operational test and advanced tactics development and training as Block 4 is delivered.

As noted above, on 12 March, the Department of Defense declared Milestone C and formally announced a Full Rate Production decision. The Department made this determination after considering F-35 Combined IOT&E and Live Fire Test and Evaluation Report results, System Development and Demonstration exit criteria, statutory and regulatory documentation compliance, future production strategy, and draft acquisition program baseline details. Proceeding to Milestone C and Full Rate Production required manufacturing process control, acceptable performance and reliability, adequate sustainment infrastructure, and support system establishment. Reaching this

milestone represents a whole-team effort and I am tremendously proud of the Government and industry workforce that made it possible.

CONGRESSIONAL FOCUS AREAS

While recent months have borne significant progress across the enterprise, the F-35 Program has faced its share of challenges. At a December 2023 Tactical Air and Land Forces hearing, the subcommittee noted its patience with F-35 development delays is wearing thin. The committee referenced four areas of concern including TR-3 development and fielding, propulsion and power thermal management modernization and requirements, sustainment strategy planning, and potential software capability development and testing strategies. As your Program Executive Officer, I remain committed to owning and addressing these matters head on. I understand the subcommittee also remains interested in the F-35 IOT&E report's recommendations, Block 4 delivery, future production plans, and other key topics. While these are difficult and complex challenges, their resolution is fundamental to delivering the capable, available, and affordable F-35 our warfighter expects. The following testimony provides updates on these *Congressional Focus Areas*, followed by additional program updates.

TR-3 Development and Fielding

TR-3 has taken far too long to deliver. To get a full understanding of development issues, we initiated a Software Architecture Independent Review Team early this year. While the Independent Review Team's work continues, their initial findings highlight hardware design maturity as a significant complicating factor in software integration. Today, this hardware maturity manifests in low manufacturing yields of parts necessary for aircraft production. We also find

ourselves using software to overcome hardware design maturity challenges. The Software Independent Review Team's initial conclusion is that we have a solid software architecture, but until the underlying hardware is fully mature, the F-35 Program will continue to struggle with software integration efficiency.

The Software Architecture Independent Review Team also made significant observations about system performance, labs, effect of diminishing manufacturing sources on Technology Refresh programs, and the industry and Government technical workforce. We are planning to act on all Independent Review Team findings, as we mitigate risk in the remaining schedule to field combat capable TR-3 configured F-35 aircraft.

The first realistic opportunity for TR-3 aircraft acceptance is July 2024, and even that date bears risk. The Software Architecture Independent Review Team predicts that delivery in August or September 2024 is more likely. TR-3 aircraft acceptance depends upon completing a stable, capable, and maintainable software build for release to flight test. Achieving this depends upon fixing specific issues in TR-3 software. The F-35 JPO and industry are working intensely to resolve the deficiencies to improve software stability on the ground and in the air. Future risks hinge upon whether TR-3 will require additional incremental software releases to test and implement critical fixes. If risk manifests in labs or flight test, TR-3 may require additional software releases (taking between two and six weeks per release).

The F-35 JPO is working with warfighters across the U.S. Services, F-35 Partners, and Foreign Military Sales customers on a plan to deliver TR-3 software in two releases. The first release (40P01) is a truncation of the TR-3 software at a point when the code is stable, capable, and maintainable to deliver TR-3 configured aircraft for use in combat training, but it is not until

the second software release (40P02) that full combat capability is realized. F-35 JESB stakeholders have approved TR-3 truncation acceptance criteria.

While these circumstances are not ideal, the decision to truncate TR-3 software has significant benefits – including delivering F-35 aircraft to support training squadrons, stand-up of new squadrons, exercising TR-3 maintenance, and decreasing the time that F-35s are parked in long term storage. Truncation also allows the F-35 Enterprise to fully transition personnel, labs, and flight test capacity onto the next Block 4 software release (40P02) which provides significantly more combat capability. We are working closely with our industry counterparts to ensure accountability and collaboration throughout this effort and will continue to eliminate risk wherever possible. The F-35 Program's primary development objective remains delivery of safe, stable, capable, and maintainable TR-3 aircraft to the fleet.

Engine and Power Thermal Management Modernization

The Engine and Power Thermal Management Modernization (EPM) pre-acquisition program is an engine and air vehicle modernization program that supports future Mission Systems capabilities while restoring engine life. It consists of engine modernization and Power Thermal Management Upgrade (PTMU) and is progressing with support from the U.S. Services, Congress, and our International Partners. The JPO is working with the Services, Department of Defense, and Congressional Defense Committees to align EPM within the F-35 portfolio to ensure proper oversight.

The F-35 Program remains committed to executing EPM as we provide increased cooling and electrical power generation required to support capabilities beyond Block 4 for all variants while reducing lifecycle costs through engine life restoration. Engine Core Upgrade (ECU) risk

reduction design efforts have progressed nominally, with propulsion leaders from the Departments of the Air Force and Navy reviewing the process regularly. The JPO is continuing to develop and refine subsequent phases of the EPM acquisition strategy, including market research.

The F-35 Program is working aggressively to meet EPM requirements, including congressional report requirements associated with this topic. More than a dozen studies supporting the cost-benefit and technical risk analysis are complete or ongoing. This analysis will continue for various vehicle systems into 2025. The JPO remains in discussions with the Office of the Secretary of Defense, Cost Assessment and Program Evaluation (OSD CAPE) on when to begin an EPM independent cost estimate and will continue to engage with OSD stakeholders as we move toward establishing EPM as a major subprogram to the F-35.

Sustainment Strategy Planning

When I last testified before this subcommittee, I emphasized the F-35 JPO's commitment to ensuring contracts fairly and effectively motivate industry behavior to meet fleet readiness requirements. At that time, in close coordination with DoD and U.S. Service senior leadership, the F-35 JPO paused its path to a system-level Supply Chain Performance Based Logistics (PBL) construct with Lockheed Martin. Today, the F-35 JPO is committed to ensuring the F-35 fleet has the required Air Vehicle Sustainment contract coverage. With the pause of system-level Supply Chain PBL efforts, the JPO implemented a contract strategy to provide air vehicle sustainment coverage through calendar year 2028. The JPO awarded extensions to the FY21-23 contract to cover the fleet through June 2024. In parallel, the JPO is negotiating a follow-on Air Vehicle Sustainment Contract (AVSC) in two phases. The first phase will award by 1 July 2024 and provide fleet coverage through Calendar Year 2024. The second phase will award by 1 January

2025 and provide options for coverage through Calendar Year 2028. This four-and-a-half-year contract provides sufficient time to develop a new sustainment strategy around the Fiscal Year 2022 NDAA Section 142 requirement to transition sustainment responsibilities to the U.S. Services. Maximizing readiness is the annualized contract's primary objective. The F-35 Program established an Air Vehicle Sustainment Performance Working Group with U.S. Service and Partner representation to improve upon the performance incentive construct that exists in current air vehicle annualized contracts. This incentive construct will be part of the award on 1 January 2025, and will be built to drive the right industry behaviors as we work together to improve readiness.

Software Development Strategies

As noted previously, the F-35 JPO chartered a Software Architecture Independent Review Team of U.S. Air Force, U.S. Navy, academic, and industry software experts to evaluate TR-3's architecture for any flaws that prevent execution. The team determined the F-35 Program has inadequate digital infrastructure for modern software development across industry labs, resulting in extensive regression testing and late discovery of defects. Software Architecture Independent Review Team recommendations include leveraging 'Iterative Integration' to minimize significant hardware concurrency, embracing a 'Model-Sharing' construct among Lockheed Martin and suppliers to facilitate collaborative integration and test, and significantly improving digital infrastructure for industry-to-industry and Government-to-industry connections for collaboration in a digital virtual environment. The F-35 JPO is exploring which commercial software development processes are most appropriate to modernize software architecture, and we are

partnering with industry to identify the digital infrastructure needed to discover defects early in the software development process.

The F-35 Program is working to establish and implement digital engineering, modeling, and simulation initiatives to reduce operations and sustainment costs while increasing aircraft availability and mission capability rates. The Government and industry team began efforts to transform engineering and capability development activities toward a model-based approach in 2019. The program has developed seventeen "born digital" Block 4 capabilities and twenty-eight Program of Record capabilities using digital models. F-35 Air System Model (ASM) development continues to mature and will generate source data for technical reviews and certification events.

The F-35 Enterprise remains focused on upgrading modeling and simulation fidelity to discover defects earlier in development. High-fidelity digital modeling and simulation in the Multi-ship Virtual Development Lab (MVDL), Hardware in the Loop (HITL) lab, and DoD anechoic chambers all have the potential to drive test optimization, alleviate flight test capacity demand, and reduce cost by identifying defects earlier. As noted above, the agreement reached on F-35 In a Box in March has significant implications for organic software development and paves the way for users to begin integrating current F-35 operational software into the JSE, and to prepare for follow-on test and evaluation of Block 4 capabilities. Meanwhile, the F-35 JPO is working closely with the OUSD Research and Engineering Test Resource Management Center to establish a common data management system for data analysis of development and operational test data, while enabling data sharing and collaboration with applicable Government and industry test sites, other platforms, and their domains. This data management system will support modeling and simulation accreditation, capability-level verification, and mission-level test and evaluation of F-35 effectiveness, suitability, and survivability.

These and other F-35 digital engineering efforts are beginning to yield results. F-35 In a Box completed 'for score' events in September 2023. Joint Operational Test Team (JOTT) members ran and validated sixty-four scenarios during a two-week event in the JSE facility at Naval Air Station Patuxent River, paving the way for F-35 IOT&E closure. I'm grateful to the collective Air Force Operational Test & Evaluation Center, Naval Air Systems Command (NAVAIR), DOT&E, JOTT, JPO, and Lockheed Martin Team that brought JSE to life and made this success possible. During the same month, the F-35 Program closed the first two Multi-Ship Infrared Search and Track (IRST) Increment One Verification Result and Reports using MVDL evidence. Increasing test facility capabilities remains fundamental to alleviating flight test capacity constraints and reducing flight test costs. As we look to the future, additional opportunities include engine predictive capabilities, enhanced determinate assembly capabilities, and creation of a microelectronics hardware accurate digital twin.

Despite this progress, significant time and investment are required to improve the F-35's development infrastructure for faster software development timelines and necessary capacity given the F-35's scale and complexity. We must go faster.

F-35 Initial Operational Test and Evaluation

In March 2024, DOT&E released its F-35 IOT&E report. The classified report includes evaluations of F-35 combat effectiveness against current and future threats and assesses the fleet's sustainment posture. The F-35 performs very well against the threat for which it was designed. However, the threat continues to evolve. The report emphasizes the importance of Block 4 capabilities. The F-35 JPO agrees with the majority of the report's recommendations and has either already addressed, or is addressing, these recommendations through current and planned efforts.

As the F-35 Program addresses the IOT&E report's recommendations, the enterprise remains focused on reimagining and delivering Block 4 capabilities while maximizing fleet readiness. To ensure the F-35 retains its competitive edge, we must deliver Block 4 capabilities as soon as possible, and must continue to make sustainment and reliability improvements. We are committed to working with the operational test community as we move forward across these focus areas. The F-35 JPO appreciates this subcommittee's continued interest in the report's findings and looks forward to addressing any questions as required in the months ahead.

PROGRAM INITIATIVES

Since I last testified in December 2023, the F-35 Program established capability at one new base and on one new ship, bringing F-35 totals to 32 bases and 12 ships (59 squadrons in total), respectively. To date, F-35 users have logged over 815,000 flight hours across the globe. Within ten years, there will be over 600 F-35s operating in the European theater alone, and fewer than 60 will be U.S. owned. The F-35 Partnership's shared commitment and mission bring game-changing value for coalition combat and our taxpayers. I'm tremendously proud of our multinational F-35 JPO team members who work tirelessly to maximize readiness, minimize cost, and enhance survivability throughout the enterprise. The following updates address progress across corresponding Program Initiatives.

War on Readiness

In March 2023, I set a target to increase the U.S. fleetwide F-35 mission capable rate by 10% (to 64%) by the end of March 2024. To accomplish this, we initiated the 'War on Readiness' and assembled a Fleet Readiness Team dedicated to understanding and addressing complex

challenges that negatively affect fleet mission capability. With a focus on top degraders, supply and maintenance challenges, and issues affecting long-term-down and out-of-reporting aircraft, the team implemented multiple initiatives to drive improvements to the F-35 Enterprise. Two major War on Readiness initiatives include stand-up of the F-35 Readiness Control Board (RCB) to identify degraders, conduct root cause analysis, and implement corrective actions and the initiation of Readiness Health Assist (RHA) site visits to help F-35 user sites create individualized plans to mitigate unique challenges. The F-35 Executive Leadership Team is engaging directly with suppliers to ensure necessary focus is placed on top degraders affecting the fleet. War on Readiness stakeholders meet bi-weekly with F-35 users, industry, and JPO personnel to "get tactical" in addressing specific sustainment challenges. I'm extremely proud of this team's progress over the past year.

As of March 2024, our U.S. F-35 fleet mission capable rate averaged 55.7%, up 2.6% since last year's spring hearing. Over the past year, mission capable rates have risen above the 64% target for short periods; however, we have not yet sustained the levels of readiness our users expect. While these figures indicate only a slight improvement over the past year, and these rates remain unacceptable, the importance of establishing the War on Readiness to focus on top degraders, overcome supplier disruptions, maximize industrial capacity, remove barriers, and support the user community cannot be overstated. Due to the War on Readiness, the sustainment and supply chain data at our disposal today is greater than at any point in our program's history. Our progress is not all aspirational – and this effort is also yielding real-time results. Since March 2023, F-35 stakeholders have resolved 21 of the top 40 readiness degraders. A small number of top degraders continue to disproportionality hinder fleet availability. If we resolved the impact of our remaining

top two degraders, U.S. Fleet mission capable rates would increase to over 70%. The program remains committed to aggressively curtailing the harmful effects of these two degraders.

The F-35 Program notes the committee's continued interest in F135 power module availability. I'm pleased to report the engine sustainment enterprise remains on track to produce power modules at a rate sufficient to meet anticipated demand. As of April 2024, the engine non-mission capable, supply (NMC-S) rate is just 1.1% against a requirement of 5%. Engine sustainment success remains critical as we expand our global propulsion maintenance nodes to meet current and future demands.

War on Cost

The F-35 Program recently marked the first anniversary of the 'War on Cost' – an initiative designed to drive affordability throughout the enterprise. The F-35 Affordability Directorate leads this initiative and is my primary conduit for holding the enterprise to account. In the 2023 Annual Cost Estimate (ACE), the F-35 JPO captured an additional $13.6B (CY12$) in sustainment cost reductions over the program's lifecycle, bringing the total captured savings to date to $33.7B (CY12$). I look forward to providing updated captured savings when the 2024 ACE is finalized.

Our efforts are yielding results across development, production, and sustainment. In terms of development, the program is working with industry partners to identify and drive out inefficiencies in capability development roadmaps. In production, the team is conducting business case analyses to support future production contracting strategy discussion, process efficiency, and automation opportunities. Sustainment efforts have yielded impressive results and are continuing to mature cost reduction initiatives as we seek out organic maintenance opportunities, increase life limits to reduce supply chain pressures, and update engine induction schedules. The F-35 JPO has

driven F-35A Cost Per Tail Per Year (CPTPY) down from $8.7M in 2014 to $6.4M in 2022 (CY12$) and the Cost Per Flight Hour from $87.3k to $36.1k (CY12$) over the same period. Air system affordability remains a top priority for the F-35 Program and I look forward to keeping you apprised of our progress.

War on Cyber

Recognizing the influence of the global cyber environment, the F-35 Program maintains an elevated emphasis on cyber survivability through a War on Cyber. This initiative ensures that acquisition planning and execution is infused with relevant cyber policy and guidance from development through sustainment. Since kicking off in June 2023, F-35 cyber stakeholders have achieved heightened focus on software management, enhanced cyber integration with systems engineering and test, and stronger relationships with our DoD operational cyber partners within the U.S. Services and U.S. Cyber Command.

ADDITIONAL PROGRAM UPDATES

Reimagining Block 4

Development and production concurrency remains Block 4's most critical challenge, and we are dealing with its consequences today. In Calendar Year 2023, the Defense Acquisition Executive directed an F-35 Independent Technical Baseline Review Team to assess Block 4 capabilities and requirements, delivery timelines, test infrastructure and capacity, and other resource constraints. The Technical Baseline Review assessed that numerous Block 4 capabilities will not deliver until the 2030s due to technical complexity, software efficiency, human and financial resourcing, flight test capacity, lab quality and capacity, and lack of defined requirements.

Over the past 12 months, the JPO focused on improving the systems engineering required to properly characterize the concurrency between development and production. In May 2023, we established a new Block 4 contract which established Capability Decision Points (CDPs) to rigorously assess the technical maturity of hardware and software and the readiness for introduction into F-35 aircraft production lots. The JPO is confident in Block 4 delivery dates associated with the rigorous CDP process. We continue to apply this process to additional capabilities to bolster schedule realism. As previously mentioned, in February 2024, the Department of Defense established a Software Architecture Independent Review Team to assess the underlying TR-3 hardware and software architecture, provide recommendations for establishing a more agile software development framework, and make recommendations in support of the next F-35 operating system technology refresh.

In alignment with the Software Independent Review Team and Technical Baseline Review initiatives, the F-35 Program seeks to define a *Reimagined Block 4* as "must-have" content to maintain competitive advantages against our adversaries. We anticipate Reimagined Block 4 will include a subset of the original 88 JESB-approved capabilities. Reimagined Block 4 will likely include common capabilities for Electronic Warfare; Communication, Navigation, and Identification; Sustainment, and new weapons for the Partnership, plus U.S. Service-unique capabilities and Partner-unique capabilities. Reimagined Block 4 must consist of "what industry can actually deliver" across the Future Years Defense Program (FYDP) and be consistent with the JESB-directed development funding cost cap. This approach is subject to buy-in from the Defense Acquisition Executive, Service Acquisition Executives, Joint Staff, U.S. Services, and F-35 JESB. To succeed in this effort, the F-35 Enterprise must continue applying more robust systems engineering in the Block 4 program to establish realistic cost, schedule, and performance targets

for the Block 4 major subprogram that the Department plans to formally establish within the next year.

Weapons

The F-35 Enterprise continues to seek paths to accelerate weapons integration. The team is aggressively pursuing a two-year sprint to integrate certain new weapons. In support of these efforts, the program completed ground vibration testing, structural coupling testing, and a heavy external stores risk reduction flight test program. We intend to deliver these capabilities two years ahead of our standard weapon integration timeline.

Lot 18-19 Status and Plans

The F-35 production contract for Lot 18 and Lot 19 aircraft will deliver F-35s to U.S. Services, Partners, and FMS customers, increasing F-35 operational capacity worldwide. International demand for F-35 aircraft is growing, as evidenced by additional aircraft procurement by Korea, the addition of the Czech Republic as a Foreign Military Sales customer, and other allies soon to follow. Nations across the globe continue to competitively select F-35 to meet their national defense requirements.

In October 2023, Lockheed Martin submitted a proposal for Lot 18 and Lot 19 production. In recent F-35 productions lots, suppliers have experienced significant financial pressures driven by labor wage inflation, material inflation, and increased European energy prices. We continue to work to drive down the cost of the air vehicle; however, these realities may drive an increase to prices in the Lot 18-19 production contract. Resolving these challenges requires partnership between Government and industry stakeholders as the team works towards awarding the Lot 18-

19 production contract in Fiscal Year 2024. Beyond the Lot 18 and Lot 19 contract, we must consider longer-term contract arrangements to stabilize the F-35 industrial base and utilize industry standard indices.

The F-35 Program intends to shift to a larger block-buy strategy for Lots 20-24 to establish greater stability within the F-35 supply base and reduce cost. The program plans to pursue Economic Order Quantity (EOQ) funding, subject to the availability of funds, to enable prime and subcontractors to make longer-term supply chain investments that reduce overall cost. EOQ has the potential to save up to $1.1B across the Lot 20-24 air vehicle production contract, encourage F-35 suppliers to make capital investments to further reduce cost, and avoid costly supply chain disruptions that occur under current shorter-term agreements. EOQ funding is critical to maintain stable production cost. A stable supply base must be a high priority for all F-35 stakeholders.

ALIS-to-ODIN Transition

The F-35 JPO continues to evolve its legacy maintenance system, ALIS, into a modern system called ODIN. The transition program, known as ALIS-to-ODIN (A2O), is maturing software, hardware, data, and infrastructure activities with a focus on progressively delivering value to users while being responsive to warfighter priorities.

In 2023, the program encountered technical complexities that delayed ALIS software releases. The latest ALIS software release is progressing through flight test, ensuring that all critical findings are resolved and that a robust technical solution is available to the global fleet. This ALIS software update addresses significant software obsolescence issues and continues to improve the system's cyber survivability posture. It further adds initial data centralization functionality. Data centralization marks a significant step towards enabling data-driven decision

making at the country level. Progress continues with improvements in data quality, and we are maintaining supply ready for issue around ninety percent – significantly improved from approximately forty percent three years ago. Increased data integrity contributes to ongoing efforts to improve efficiency and reduce cost. The F-35 JPO has begun initial planning for the evaluation, development, and procurement of a F-35 Fleet Management capability to provide insight into fleet utilization, availability, and global resource allocations.

In parallel, the JPO continues to develop the foundational architectural elements of ODIN to simplify future application modernization and enable faster and more frequent ODIN updates to support user needs. The program continues making progress in developing "infrastructure as code," which allows for the fielding of software independent of underlying hardware and enables the seamless transition of code into developmental and production environments, including Government-owned clouds.

In 2023, the program successfully fielded unclassified ODIN hardware for new maritime and land-based site activations, and established contracts to continue the replacement of fielded ALIS hardware with the new, more capable and supportable ODIN hardware. The JPO is currently testing classified ODIN hardware elements to enable future fielding of complete hardware kits. As part of this modernization effort, the JPO streamlined the supply chain for ODIN hardware by purchasing hardware directly from the Original Equipment Manufacturer and providing it as Government Furnished Equipment to improve acquisition agility and affordability.

Combat Data Systems

F-35 mission data translates the complex operational electromagnetic environment collected by the aircraft's sensors into an actionable situational view for the pilot. When combined

with the aircraft's low observability characteristics, this information enables F-35 pilots to act and engage first. The operational environment is constantly changing, and mission data must change with it. F-35 Combat Data Systems (CDS) generate data and planning needed to perform a successful mission and enable data collection, distribution, and analysis for each mission.

The F-35 Program continues to invest and modernize the software and hardware 'tools' in reprogramming laboratories and at operational mission planning sites that deliver Block 4 capability compliant and operationally viable Mission Data Files (MDF) required for every flight mission. The F-35 CDS Program is executing agile Common Reprogramming Tool (CRT) development, which will enable the program to build advanced MDFs to support TR-3 and Block 4 advanced sensors. Meanwhile, we are continuing work to build the next generation of electromagnetic stimulators for mission data reprogramming laboratories to better simulate more agile and dense threat environments as well as the new spectrum visible to Block 4 sensors.

We will continue development and soon begin fielding Next Generation Mission Planning modernization hardware to replace Diminishing Manufacturing Sources and meet security requirements for improved cyber survivability. The Mission Planning Enterprise is successfully developing the next generation of mission planning software called Next Generation Open Mission System (NOMS) completely in the Government "JPO" Cloud environment, which will bring together U.S. Air Force and U.S. Navy Government software depots across the country. The JPO Cloud environment will also bring together multiple industry partners to include Lockheed Martin, Boeing, Northrop Grumman, and small businesses in a 500-person software factory. NOMS will begin replacing elements of the Joint Mission Planning Software (JMPS) in late 2025 and will fully replace JMPS in 2026.

The F-35 CDS Program is working closely with the 350th Spectrum Warfare Wing to better utilize F-35 sensor data to support rapid reprogramming requirements. We continue to make progress posturing our mission data enterprise to respond quickly to new and emerging threats we anticipate in a near pear conflict. In addition to these priorities, the program received final disclosure and policy approvals enabling all F-35 operators to receive Coalition Mission Data Files (CMDx). A CMDx provides coalition air component commanders the assurance that all assets are seeing the same thing at the same time. The multiplying force of our F-35 Partners and Foreign Military Sales customers is undeniable and data interoperability is the cornerstone of integrated deterrence and coalition warfare. We will continue to improve tools like CMDx and common mission planning environments to improve interoperability in response to warfighter demand.

Training Systems and Simulations

The Training Systems and Simulation (TSS) PMO is responsible for development, delivery, operation, and maintenance of F-35 training systems including Pilot Training Devices, Maintenance Training Devices, Technical Infrastructure Systems, and the JSE. F-35 Training Systems are critical enablers to produce mission qualified pilots and maintainers. Training systems are comprised of hardware, software, subsystems, equipment, and reference data required to design, develop, deliver, evaluate, and refine training with capacity and fidelity to enable aircrews to train for the high-end fight. TSS is changing the way we think about Training and Simulation – and high-fidelity simulation is the best way to fully test evolving capabilities.

F-35 TSS efforts have yielded significant results in recent months. The JSE program recently completed development, verification, validation, and accreditation of the F-35 JSE, enabling completion of IOT&E mission tests in a simulated environment. JSE runs the F-35's

mission systems software along with other software models (such as other weapons and modern threat systems) to provide complex mission scenarios for testing that the program cannot replicate in a real-world environment. In September 2023, JSE received accreditation as an operationally representative environment, and was deemed adequate to complete IOT&E mission tests. As noted above, F-35 stakeholders conducted the final 64 mission tests the same month. As we look to the future, JSE efforts will engage closely with Mission Systems efforts to integrate new Block 4 capabilities. In 2023, as part of these advanced training and simulation efforts, the F-35 JPO also supported fielding of a Government-owned, JPO-managed, and Naval Air Warfare Center Aircraft Division-developed F-35 Effects Based Simulator (EBS).

The F-35 Program will continue to modernize training systems by significantly increasing their computing power. We recognize the need to support multiple synthetic environments, and our new software architectures provide more efficient reuse of components between the various environments (such as JSE, Pilot Training Devices, and MVDL development stations), reducing the time between fielding software updates on the Air Vehicle and in synthetic environments. With an eye towards affordability, the TSS PMO continues to improve pilot training device fidelity and capability. We will continue to deliver world class training capability to an expanding F-35 fleet that is operationally relevant, affordable, and sustainable.

Addressing Government Audit Recommendations

The F-35 JPO remains an open and committed partner to the GAO's oversight mission, and we are currently supporting six unique audits across two different GAO mission teams – as well as three audits from the Department of Defense Office of Inspector General (DoD IG) – which encompass the entirety of the F-35 acquisition lifecycle.

The JPO works actively to implement and close GAO recommendations, as well as recommendations received from other audit agencies. In addition to these active audits, there are sixty-four issued recommendations (fourteen pending closure) from GAO, DoD IG, and the Air Force Audit Agency that are being implemented across the F-35 Enterprise. While independent program oversight is beneficial, these reports drive significant manpower requirements within the F-35 Program. Here in the JPO, implementation activities have already begun. My team is working diligently to implement these recommendations and will continue to maintain transparency and communication with our GAO colleagues.

Business Operations & Human Capital

People are our number one resource. We must continue investing in appropriately staffing the F-35 Program (Government and industry) with talent necessary to continuously develop, produce, deliver, and sustain the F-35 Air System. We are strategically implementing initiatives to incentivize, recruit, retain, and professionally grow our people to meet the challenges in front of us. Last year, the Air Force Life Cycle Management Center (AFLCMC) and NAVAIR analyzed the F-35 JPO's workforce demands and size. As I testified last year, this analysis highlighted several staffing concerns, and AFLCMC and NAVAIR remain committed to providing their support in attracting and retaining a skilled workforce that meets F-35 Program priorities and customer demands. In support of this effort, we are improving and investing in our workspace to create an environment to incentivize commitment by our most valuable resource as they drive the F-35 Program to realize success as we develop, produce, deliver, and sustain three aircraft variants. I'm appreciative of the U.S. Services' engagement in co-developing solutions to meet near and long-term F-35 Program priorities.

CONCLUSION

Since I last testified before this committee in December 2023, the F-35 has continued to demonstrate its real-world capability in training and operational activities across the globe. We are making headway in addressing key development and sustainment challenges, though progress is not happening quickly enough. The team we have in place understands these challenges today better than ever before, and we will deliver on our commitments. I remain tremendously proud of the men and women throughout this F-35 Enterprise who are working tirelessly to bring the next generation of capabilities to bear on the F-35 platform.

The work we're achieving here enables capabilities unlike any the world has seen before. Meanwhile, our adversaries are honing capability of their own, and we will not become complacent. Our enterprise is being tested in new ways through real-world conflicts and is proving capable, ready, reliable, and resilient. We are continuing to prioritize depot stand-up, organic warehousing and transportation, engine modernization, and logistics information system modernization. Digital engineering and enhanced modeling and simulation methodologies will continue to accelerate capability delivery. The March 2024 Full Rate Production decision will drive supplier confidence for years to come and allow us to focus on the future rather than reporting on the past.

This is professional acquisition at its finest, and I couldn't be more proud to lead this organization. Thank you once again for the opportunity to discuss our progress, challenges, and opportunities. This subcommittee's support and oversight are essential to our success.

BIOGRAPHY UNITED STATES AIR FORCE

LIEUTENANT GENERAL MICHAEL J. SCHMIDT

Lt. Gen. Michael J. Schmidt is the Program Executive Officer and Director for the F-35 Lightning II Program. In this capacity, he leads the F-35 Joint Program Office in the life-cycle program management of the F-35A, F-35B, and F-35C, the fifth-generation strike fighter of choice for the Air Force, Navy, Marine Corps, seven international partners, and seven current Foreign Military Sales customers.

Lt. Gen. Schmidt entered the Air Force in 1991 after graduating from Iowa State University as an Industrial Engineer and ROTC distinguished graduate. He served in numerous engineering, program management, and leadership positions. He worked as a Lockheed Martin program manager via the Education with Industry program. He served as Aide-de-Camp to the Commander of Air Force Materiel Command, both an Air Force Legislative and Appropriations Liaison, the F-35 Program Element Monitor, an advisor to the Afghan National Army, and commanded the 696th Armament Systems Squadron. Lt. Gen. Schmidt then served as Deputy for Tactical Aircraft Systems in the Office of the Secretary of Defense and as Senior Materiel Leader for Contractor Logistics Support Division at Oklahoma City Air Logistics Center. He also served as Program Executive Officer for Fixed Wing Programs at U.S. Special Operations Command; Program Executive Officer for Intelligence, Surveillance, Reconnaissance and Special Operations Forces at Air Force Materiel Command; Program Executive Officer for Fighters and Bombers; and, most recently, as Program Executive Officer for Command, Control, Communications, Intelligence, and Networks. He is a graduate of the Air Force Legislative Fellows Program and the National War College.

EFFECTIVE DATES OF PROMOTION

Second Lieutenant
October 08, 1990

First Lieutenant
October 08, 1992

Captain
October 08, 1994

Major
November 01, 2001

Lieutenant Colonel
May 01, 2005

Colonel
September 01, 2009

Brigadier General
January 01, 2016

Major General
July 31, 2019

Lieutenant General
July 05, 2022

EDUCATION

1990 Bachelor of Science, Industrial Engineering, Iowa State University, Ames
1993 U.S. Army Air Assault School, Fort Rucker, Ala.
1995 Master of Business Administration, Finance, with distinction, Bentley College, Waltham, Mass.
1997 Squadron Officer School, Maxwell Air Force Base, Ala.
2001 Advanced Program Managers Course, Defense Systems Management College, Fort Belvoir, Va.
2003 Certificate in Legislative Studies, Georgetown University, Washington, D.C.
2003 Legislative Fellow, Capitol Hill, Washington, D.C.
2008 Master of National Security Strategy, National War College, Fort Lesley J. McNair, Washington, D.C.
2011 Executive Program Managers Course, Defense Acquisition University, Fort Belvoir, Va.
2012 U.S. Air Force Leadership Enhancement Program, Center for Creative Leadership, Greensboro, N.C.
2016 Senior Acquisition Management Course, Defense Acquisition University, Fort Belvoir, Va.

ASSIGNMENTS

1. July 1991–April 1992, Deputy Program Manager, Joint Tactical Information Distribution System Navy Integration, JTIDS Joint Program Office, Hanscom Air Force Base, Mass.
2. May 1992–March 1994, JTIDS Production Program Manager, JTIDS Joint Program Office, Hanscom AFB, Mass.
3. April 1994–August 1995, E-8C Aircraft Production Program Manager, Joint Strategic Target Attack Radar System

(Joint STARS) Joint Program Office, Hanscom AFB, Mass.
4. September 1995–June 1996, Fire Control Systems Program Manager (Education with Industry), Lockheed Martin Electronics and Missiles, Orlando, Fla.
5. July 1996–July 1997, F-22 Legislation and Oversight Program Manager, F-22 System Program Office, Wright-Patterson AFB, Ohio
6. August 1997–May 1999, F-22 Edges and Empennage IPT Lead, F-22 System Program Office, Wright-Patterson AFB, Ohio
7. June 1999–May 2000, Commander's Action Team Lead, Directorate of Requirements, Headquarters Air Force Materiel Command, Wright Patterson AFB, Ohio
8. June 2000–August 2001, Aide-de-Camp to the Commander, Headquarters AFMC, Wright-Patterson AFB, Ohio
9. September 2001–September 2002, Chief, Congressional Relations, Office of Air Force Legislative Liaison, the Pentagon, Arlington, Va.
10. October 2002–July 2003, Air Force Legislative Fellow, Capitol Hill, Washington, D.C.
11. August 2003–June 2005, Joint Strike Fighter (F-35) Lead Program Element Monitor, the Pentagon, Arlington, Va.
12. July 2005–July 2007, Commander, 696th Armament Systems Squadron (AIM-120D), Eglin AFB, Fla. (September 2006–January 2007, Program Analysis Team Chief, CJ-8, Combined Security Transition Command-Afghanistan, Kabul, Afghanistan)
13. August 2007–June 2008, Student, National War College, Fort Lesley J. McNair, Washington, D.C.
14. July 2008–June 2010, Deputy for Tactical Aircraft Systems, Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, Program Systems Acquisition, Air Warfare, the Pentagon, Arlington, Va.
15. July 2010–May 2011, Chief, Contractor Logistics Support Sustainment Division, Oklahoma City Air Logistics Center, Tinker AFB, Okla.
16. May 2011–July 2014, Program Executive Officer for Fixed Wing Programs, U.S. Special Operations Command, MacDill AFB, Fla.
17. July 2014–April 2016, Program Executive Officer for Intelligence, Surveillance, Reconnaissance and Special Operations Forces, Air Force Life Cycle Management Center, AFMC, Wright-Patterson AFB, Ohio
18. April 2016–April 2018, Program Executive Officer for Fighters and Bombers, AFLCMC, AFMC, Wright-Patterson AFB, Ohio
19. April 2018–July 2022, Program Executive Officer for Command, Control, Communications, Intelligence and Networks, AFLCMC, AFMC, Hanscom AFB, Mass.
20. July 2022–present, Program Executive Officer, F-35 Lightning II Joint Program Office, Arlington, Va.

SUMMARY OF JOINT ASSIGNMENTS
1. September 2006–January 2007, Program Analysis Team Chief, CJ-8, Combined Security Transition Command-Afghanistan, Kabul, Afghanistan, as a lieutenant colonel
2. July 2008–June 2010, Deputy for Tactical Aircraft Systems, Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, Program Systems Acquisition, Air Warfare, the Pentagon, Arlington, Va., as a lieutenant colonel and a colonel
3. May 2011–July 2014, Program Executive Officer for Fixed Wing Programs, U.S. Special Operations Command, MacDill Air Force Base, Fla., as a colonel
4. July 2022–present, Program Executive Officer, F-35 Lightning II Joint Program Office, Arlington, Va., as a lieutenant general

MAJOR AWARDS AND DECORATIONS
Distinguished Service Medal
Defense Superior Service Medal with oak leaf cluster
Legion of Merit
Defense Meritorious Service Medal with oak leaf cluster Meritorious Service Medal with three oak leaf clusters
Joint Service Commendation Medal with oak leaf cluster
Joint Service Achievement Medal
Air Force Achievement Medal Afghanistan Campaign Medal

EFFECTIVE DATES OF PROMOTION
Second Lieutenant Oct. 8, 1990
First Lieutenant Oct. 8, 1992
Captain Oct. 8, 1994
Major Nov. 1, 2001
Lieutenant Colonel May 1, 2005
Colonel Sept. 1, 2009
Brigadier General Jan. 1, 2016
Major General July 31, 2019
Lieutenant General July 5, 2022

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UNTIL APPROVED BY THE
COMMITTEE ON ARMED SERVICES
U.S. HOUSE OF REPRESENTATIVES

STATEMENT

BY

DR. DOUGLAS C. SCHMIDT

DIRECTOR, OPERATIONAL TEST AND EVALUATION

OFFICE OF THE SECRETARY OF DEFENSE

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

NOT FOR PUBLIC RELEASE
UNTIL APPROVED BY THE
COMMITTEE ON ARMED SERVICES
U.S. HOUSE OF REPRESENTATIVES
HASC – APRIL 16, 2024

Chairman Wittman, Ranking Member Norcross, and distinguished members of the Tactical Air and Land Forces Subcommittee, it is an honor to be here to provide a summary of the results and recommendations on tactical fighter aircraft and related programs that are under my oversight. I would like to focus my opening comments on three areas: the combined report on F-35 Initial Operational Test and Evaluation (IOT&E) and Live Fire Test and Evaluation (LFT&E), key findings across other programs, and operational test infrastructure needed to support testing current and emerging tactical weapon systems.

DOT&E released its combined F-35 IOT&E and LFT&E report in February 2024 and in March the DOT&E staff briefed those results to this subcommittee. The report provides an assessment of the overall mission capability of the F-35 in the Block 3F configuration, in terms of its operational effectiveness, suitability and survivability. DOT&E approved the Service Operational Test Agency (OTA) test plan in increments, beginning with cold weather testing in January 2018 and culminating in approval of the final iteration of testing in September 2023 in the Joint Simulation Environment (JSE). Approval of the Service test plan for testing in the JSE was contingent upon Service OTA accreditation of the JSE and a certification of readiness for test by the F-35 Program Executive Officer. The IOT&E was adequate to evaluate overall mission capability in the operational scenarios and conditions directed in the Service OTA test plans. The effectiveness evaluation covered all of the Service's missions expected to be assigned to the F-35 and included 89 open-air mission trials, 75 live weapon events, and 64 mission trials in the JSE. Suitability data were collected during test events and unit deployments to environments including cold weather, ships, forward bases, and austere operating locations. Test teams also collected reliability, maintainability, and availability data on the operational test aircraft throughout the test period to support the overall suitability evaluation. Digital modeling,

supported with data collected from the live test events and operational units, augmented live results to evaluate key performance parameters and suitability measures. Test teams conducted 24 cyber survivability events on aircraft subsystems and ground support systems and evaluated training for both pilots and maintenance personnel. A separate LFT&E, conducted from July 2002 to September 2022, assessed the F-35 aircraft and pilot's vulnerability to a variety of threats, including kinetic, chemical, biological, low-power lasers, and electromagnetic pulse and high-power microwaves expected to be encountered in combat. Test teams conducted live fire testing on an early flight test aircraft, two airframe structural test articles, and four F135 engines. Data from these tests were used in models to assess vulnerabilities to specific ballistic threats. Finally, the report also provides an assessment of post-IOT&E F-35 Block 4 Operational Testing through the F-35 capability that is currently fielded in the Block 3F configuration with the Technical Refresh-2 avionics architecture.

Next, I will move on to key findings of other tactical fighter aircraft and tactical fighter aircraft-related programs. The first is the F-15 Eagle Passive Active Warning & Survivability System, (EPAWSS). The current Electronic Warfare test infrastructure significantly limited the breadth of DOT&E's assessment of EPAWSS effectiveness during its recent IOT&E. This limitation affects all spectrum-warfare systems (especially electromagnetic attack systems like the EPAWSS and the EA-18G Growler's Next Gen Jammer – Mid-Band jamming pod). DoD's open and closed, hardware-in-the-loop laboratories and Military Test Ranges need upgrades to address these and other limitations.

The next key finding comes from the F-22A and F-35A/B/C programs. These programs have ongoing test instrumentation challenges that center around the integration of Open-Air Battle Shaping (OABS). OABS was utilized during F-22 IOT&E and FOT&E, F-35 IOT&E and

FOT&E, and F-15EX IOT&E. OABS enables high-fidelity live testing with real-time kill removal and data collection. It is already installed at several CONUS ranges and continues to expand. Multiple USAF, USN, and USMC aircraft (F-15, F-16, F/A-18E/F, F-22, and F-35) are already equipped with OABS, which requires frequent upgrades to keep up with platform and weapon program upgrade processes. OABS provides higher-fidelity, real-time shot assessments between blue and red air-to-air, surface-to-air and air-to-ground weapons engagements, kill removals and detailed mission debriefs. Data collected by the OABS system is also essential to verification, validation, and accreditation of modeling and simulation as the different platforms are integrated into, and continually upgraded, in the Joint Simulation Environment.

As the findings from recent tests show, the operational test infrastructure needed to support modern testing continues to be a challenge. The Joint Simulation Environment (JSE), is a high-fidelity battlespace environment, which is currently integrated with "F-35-in-a-Box" software, blue and red cockpits, and advanced surface and air threats that were required to support F-35 IOT&E. The JSE is rapidly expanding to support multiple-platform test and evaluation, tactics development, and high-end training for aircraft, such as the F-22 and F/A-18, while continuing to evolve to support future scenarios and aircraft requirements. The initial JSE at NAS Patuxent River, MD was followed by USAF JSE facilities at Edwards AFB, CA and Nellis AFB, NV, where stand up of capability is ongoing, along with other facilities under construction.

In addition to the JSE, DOT&E is collaborating with stakeholders on digital test infrastructure that can adapt to evolving threats. This effort includes fielding advances, such as digital, class-of-threat emulators that can be relocated and reprogrammed as the threat evolves. There are also efforts underway that involve networking ranges with these realistic, ground-

based, class-of-threat, radar emulators to create more operationally representative scenarios. These radar emulators are also integrated with OABS for realistic, real-time interactions with threats, while also capturing data from the fight. As I previously discussed, we must get critical platforms such as the F-22 and F-35 fully integrated into the OABS network to really know how we will do against the adversary and to verify, validate, and accredit the JSE. Finally, DOT&E is partnering with the Test Resource Management Center and many other stakeholders to develop a Fifth-Generation Aerial Target to support testing of our current and future tactical aircraft, sensors, and missiles, along with other joint capabilities like ships and land-based air defenses.

I would like to bring to your attention that I must recuse myself from answering or providing information on Lockheed Martin products and systems. I do want to take Questions for the Record and provide you with DOT&E's response at the appropriate classification level.

Thank you for your attention and your continuous support to our Service men and women, and I look forward to your questions.

The Honorable Dr. Douglas C. Schmidt
Director, Operational Test and Evaluation
Office of the Secretary of Defense

Dr. Douglas C. Schmidt was sworn in as Director, Operational Test and Evaluation (DOT&E) on April 8, 2024. A Presidential appointee confirmed by the United States Senate, he serves as the senior advisor to the Secretary of Defense on operational and live fire test and evaluation of Department of Defense weapon systems. DOT&E provides direct and independent reporting to Congress to give them unbiased, unvarnished assessments of system performance.

Prior to DOT&E, Dr. Schmidt served as the Cornelius Vanderbilt Professor of Engineering in Computer Science, the Associate Chair of Computer Science, and a Senior Researcher at the Institute for Software Integrated Systems at Vanderbilt University. He was also a Visiting Scientist at the Software Engineering Institute at Carnegie Mellon University, where he served as the Chief Technology Officer from 2010 to 2012.

From 2010 to 2014, Dr. Schmidt was a member of the Air Force Scientific Advisory Board, where he served as vice chair of studies on cyber situational awareness for Air Force mission operations and on sustaining hardware and software for U.S. aircraft. He also served on the advisory board for the joint Army/Navy Future Airborne Capability Environment initiative. From 2000 to 2003, Dr. Schmidt served as a program manager in the Defense Advanced Research Projects Agency (DARPA) Information Exploitation Office (IXO) and Information Technology Office (ITO).

Dr. Schmidt is an internationally renowned and widely cited researcher whose work focuses on patterns, optimization techniques, and empirical analyses of object-oriented and component-based frameworks and model-driven engineering tools that facilitate the development of distributed real-time and embedded (DRE) middleware frameworks and mobile cloud computing applications on parallel platforms running over wireless/wired networks and embedded system interconnects. His recent research focused on prompt engineering techniques and patterns that enhance the accuracy and

expressiveness of large language models and generative augmented intelligence platforms.

He has published 10+ books and over 700 papers in top technical journals, conferences, and books covering a range of topics, including high-performance communication software systems, parallel processing for high-speed networking protocols, and DRE middleware with Common Object Request Broker Architecture (CORBA), Real-time Java, object-oriented patterns for concurrent and distributed systems, concurrent and networked software for mobile devices, and model-driven engineering tools.

Dr. Schmidt served as the co-chair for the Software Design and Productivity (SDP) Coordinating Group of the Federal Government's multi-agency Information Technology (IT) Research and Development Program, the collaborative IT research effort of the major Federal science and technology agencies. The SDP Coordinating Group formulates the multi-agency research agenda in fundamental software design. Dr. Schmidt also served as the Deputy Director of the DARPA ITO, where he helped to set the national IT research and development agenda and manage the autonomous systems, network-centric command and control systems, distributed real-time and embedded systems, and augmented cognition.

In addition to his academic research, teaching, and government service, Dr. Schmidt has three decades of experience developing DRE middleware, model-driven engineering tools, and mobile cloud computing apps. He has led the development of the ADAPTIVE Communication Environment (ACE), which is a set of widely used, freely available object-oriented frameworks that contain a rich set of components that implement patterns for mission-critical DRE systems.

Dr. Schmidt received Bachelor and Master of Arts degrees in Sociology from the College of William and Mary and Master of Science and Doctorate degrees in Computer Science from the University of California, Irvine.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

APRIL 16, 2024

QUESTIONS SUBMITTED BY MRS. MCCLAIN

Mrs. MCCLAIN. 1. As the Government Accountability Office has previously noted, the recurrence of issues with the F-35 engine and Power and Thermal Management System (PTMS) is largely due to insufficient visibility into the engine's performance characteristics and requirements and a lack of coordination among the companies responsible for the aircraft's systems. a. As the Department of Defense and the Joint Program Office begin the Engine Core Upgrade, has the appropriate technical data been shared with the current PTMS provider to ensure interoperability between engine performance and the PTMS functionality? b. If the appropriate technical data has not been shared, why has the necessary information to ensure interoperability between the PTMS modernization and engine core upgrade? This is critical to avoiding past mistakes.

2. Section 226 of the FY24 National Defense Authorization Act directed a complete and comprehensive cost-benefit and technical risk analysis that evaluates and determines the PTMS modernization for the F-35. a. Given that the PTMS was uniquely designed to integrate closely with the aircraft and perform 14 mission-critical functions on the F-35, beyond air and liquid cooling, how is the Joint Program Office evaluating the technical risk to the overall f-35 program associated with integrating and subsequently requalify every PTMS function - including extensive on-aircraft integration and flight tests?

3. The Joint Program Office released in December 2023 stated that the PTMS upgrade must be ″economically retrofittable, affordable, common across all three variants of the F-35, and partner releasable. Additionally, the integration of the [Thermal Management Upgrade] TMU should not violate any air system specifications, and no changes to the air vehicle design will be considered. b. How does the government weigh each element when selecting the PTMS upgrade solution? c. As part of the ″affordability″ criteria, is the government considering the switching cost and the necessity to upend decades of investment in global sustainment architecture?

General MICHAEL SCHMIDT. 1. Yes, as part of the Preliminary Design effort and subsequent follow-on contracts, both Prime contractors have been sharing the appropriate technical data required to ensure interoperability between the engine performance and the current PTMS functionality. The ECU is being designed to accommodate a modernization PTMS solution. At this time in development, the appropriate level of technical data with regards to PTMS does not include data related to a modernized PTMS solution. It's a separate effort under the Engine Power and Modernization (EPM) program.

2. The PTMS modernization (or PTMU) team is currently operating in a competitive environment and has had little, to no communication with vendors concerning the upcoming PTMU program. Once a Lead Systems Integrator is selected and the team is able to get under contract, the first contracting effort will be a System of Systems Analysis to evaluate modernizations solutions ranging from a derivative solution to the current system to a ″clean-sheet″ solution, which could involve a complete overhaul of the current system. All functions of the overall PTMS system will be considered and evaluated as part of that initial contracting action, which will help inform the follow-on contract actions involving the on-aircraft integration and flight test.

3. Once the PTMU team is out of the competitive environment and able to get under contract with a Lead Systems Integrator, the first contracting effort will include evaluation of the Declared Statement of Requirements (DSOR) FD-652 language for a PTMU solution needing to be ″economically retrofittable, affordable, common across all three variants of the F-35, and partner releasable.″ The exact method of determining the evaluation criteria will be developed as part of the System of Systems Analysis effort, but will take into consideration all the design, development, testing, and production aspects of an upgraded PTMU solution, to include both a derivative solution and a ″clean-sheet″ solution. This evaluation will absolutely take into account the ability to leverage the existing supply chains, depot level infrastructure, and global sustainment architecture that is supporting the current PTMS system on the F-35.

RESPONSE TO QUESTIONS SUBMITTED BY MR. GIMENEZ

Mr. GIMENEZ. Homestead Air Force Base sits proudly in my district. The 482d Fighter Wing is a fully combat-ready unit capable of providing F-16C multi-purpose fighter aircraft, along with mission ready pilots and support personnel, for short-notice worldwide deployments. This base is a national security asset with power projection into the Western Hemisphere, used both for responses to national security threats and natural disasters. But Homestead has an aging F-16/C Fleet. And between FY25 and FY27, is it correct that you plan on divesting 137 F-16s? What is the plan to replace those F-16s? How will the Air Force's numerous divestment plans support Homestead Air Reserve Base fighter mission, and how will you comply with statutory requirement of the National Military Strategy?

General MOORE. The FY25 President's Budget does not include any force structure changes for Homestead Air Reserve Base (ARB) through at least FY27 and the Air Force has no plans to close Homestead ARB. The Air Force's fighter strategy outlined in the FY25 President's Budget reflects the Department's imperative to continue modernizing to meet the National Defense Strategy. The Air Force must build a capable, sustainable, and affordable force that can operate across the entire range of mission sets. The Air Force's divestment plans for F-16s center on simplifying the most diverse and complex fighter fleet in the inventory. Between block types, flight control configurations, and engine types, there are 9 different F-16 variants in use today in the Air Force. Pre-block (block 25/30/32) are the oldest variants, have mechanical flight control systems, and unique Operational Flight Program development. Consolidating to a post-block only fleet allows modernization and sustainment efforts to be focused on the 610 post-block (block 40/42/50/52) aircraft that have digital flight controls and more modern components. Delaying transformation of the fighter force produces risk. Extensive war-gaming and analysis suggests that legacy fighters, regardless of how many, are not sufficient to deter or defeat a peer adversary, especially in the Indo-Pacific. Continuing to retain legacy aircraft comes at the cost of today's readiness and tomorrow's modernization and detracts from the ability to meet the needs of the National Defense Strategy. This drives the necessity to retire some legacy aircraft to free up funding and personnel for higher priority systems.

Mr. GIMENEZ. As you embrace the fielding of Collaborative Combat Aircraft (CCA), it is reasonable to assume today's most numerous 5th generation fighter, the F-35, will be the primary manned leader of the coming CCA forces? Are there any investments we need to make now to ensure the F-35 is ready when the CCA's come online?

General MOORE. Investment analysis is ongoing for specific use cases of CCA, including possible integration with the F-35. The Air Force is committed to rapidly fielding an incremental capability to the warfighter within the current five-year plan. The first aircraft will be used by an Experimental Operations Unit, organized to quickly develop and mature tactics, techniques, and procedures; identify integration requirements and policy shortfalls; and, chart the path for future increment capabilities.

Mr. GIMENEZ. Does the FY25 Budget Request provide enough fighter aircraft to meet the Services' recapitalization needs? I am concerned that year after year we see the numbers requested going down; for example, last year's budget projected 83 F-35s in FY25, but the request came over for 68.

General MOORE. The DAF fighter strategy remains consistent with our imperative to modernize to meet the National Defense Strategy. Retaining today's legacy force structure comes at the cost of today's readiness and tomorrow's modernization. The fiscally constrained environment driven by the 2023 Fiscal Responsibility Act and reduced buying power necessitated difficult decisions, and you're seeing the impacts of that in the 2025 President's Budget. The DAF believes the 2025 budget represents the best option for spreading that risk over time.

Mr. GIMENEZ. As you embrace the fielding of Collaborative Combat Aircraft (CCA), it is reasonable to assume today's most numerous 5th generation fighter, the F-35, will be the primary manned leader of the coming CCA forces? Are there any investments we need to make now to ensure the F-35 is ready when the CCA's come online?

Admiral DONNELLY. No additional investments are needed at this time. The Navy continues to work with the Joint Program Office (JPO), the Marine Corps and the Air Force on F-35C/Collaborative Combat Aircraft (CCA) integration. Efforts are underway to develop a beyond line of sight (BLOS) communication pathway and an advanced tactical data link (ATDL) to pave the way for F-35C/CCA integration.

Mr. GIMENEZ. Does the FY25 Budget Request provide enough fighter aircraft to meet the Services' recapitalization needs? I am concerned that year after year we

see the numbers requested going down; for example, last year's budget projected 83 F-35s in FY25, but the request came over for 68.

Admiral DONNELLY. The Navy plans to optimize strike fighter recapitalization capacity given available resources, and concurrent F-35 development and production challenges. Fiscal realities and higher service priorities required the Navy to defer F-35C procurement in FY25. The FY25 budget balances these realities, and reflects a reduction in four F-35C aircraft across the FYDP. While this reduction allows the Navy to meet recapitalization needs, continued reductions will increase the risk of not meeting required strike fighter inventory levels.

Mr. GIMENEZ. As you embrace the fielding of Collaborative Combat Aircraft (CCA), it is reasonable to assume today's most numerous 5th generation fighter, the F-35, will be the primary manned leader of the coming CCA forces? Are there any investments we need to make now to ensure the F-35 is ready when the CCA's come online?

General GERING. The F-35 is, and will be for decades, the Joint Force's premier fighter platform. Collaborative Combat Aircraft (CCA) represent a critical technology that address key capability and capacity gaps to win in the future fight. As a Joint Force, we must ensure that these complimentary, yet separate, roadmaps are able to merge seamlessly in the very near future. Marine Unmanned Expeditionary (MUX) TACAIR is the USMC effort to field a fleet of CCAs that increase the lethality, survivability, and interoperability of all Aviation Combat Element (ACE) platforms. The F- 35 will be the primary leader for MUX TACAIR. Existing experimentation seeks to utilize XQ-58A Valkyrie aircraft in support of F-35 strike against an enemy target. Follow-on experimentation and prototyping are necessary to ensure that F-35 is ready when CCAs come online. Those efforts are specifically intended to build upon FY24 investments which are enabling a communications architecture with F-35 while requiring minimal configuration changes in parallel to the Program of Record (POR). Investments will include integration of Line of Sight (LOS) communications, Beyond LOS (BLOS) data links while enhancing command and control for the F-35. If funded, additional investments in this capability will support the development effort needed to fully enable a federated F-35 communication system, an off-board F-35 BLOS, while building out TACAIR (F-35 and MUX) ground system capabilities. The USMC needs to maintain the momentum for MUX TACAIR transition to POR. Funding levels in FY25 will pause F-35/CCA efforts and push POR achievement beyond USMC operational needs in the INDOPACOM AOR. The Service is ready to close this gap and position the Joint Force to close kill chains in any future fight or global crisis.

Mr. GIMENEZ. Does the FY25 Budget Request provide enough fighter aircraft to meet the Services' recapitalization needs? I am concerned that year after year we see the numbers requested going down; for example, last year's budget projected 83 F-35s in FY25, but the request came over for 68.

General GERING. The USMC remains fully committed to a POR of 420 aircraft. As the service looked to balance a multitude of service priorities, as well as right-size funding in above- and below-the-line F-35 funding, fiscal constraints led to a deferral of seven tails across the FY25 FYDP. While this reduction does not put the USMC TACAIR transition plan at risk, it pushes aircraft deliveries later than planned and reduces decision space for TACAIR planners. Any additional deferrals will put the USMC TACAIR transition plan and associated Global Force Management (GFM) requirements at risk. We appreciate the continued Congressional oversight and assistance on this issue.

Mr. GIMENEZ. The recent conflict with Israel and Hamas has been a true test of the F-35. How have the F-35s performed, and has the F-35 sustainment enterprise been able to efficiently and effectively rise to the occasion to keep these jets mission capable? What feedback are you getting from the IAF?

General MICHAEL SCHMIDT. Maximizing mission capability rates for all Partners and Foreign Military Sales customers remains a top F-35 Program priority. We are executing a War on Readiness as we work with industry teammates and our user community to tackle top degraders. Meanwhile, we are maturing sustainment capability and standing up robust depot capacity throughout the enterprise to ensure users have timely access to parts, equipment, and repair capability. Throughout its history, the F-35 Program has laid the groundwork for surge sustainment to ensure preparation for wartime activities. As we've seen in recent months, the F-35's global sustainment infrastructure, and the platform itself, are being tested. From operational and technical perspectives, our aircraft and global supply system are proving resilient. The JPO is applying lessons learned to maximize sustainment survivability, responsiveness, and flexibility throughout the fleet. While information associated with operational data and outcomes for specific user nations is sensitive in

nature, the F-35 JPO welcomes the opportunity to provide additional details to Members and Professional Staff in appropriate forums.

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