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HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE 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

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SUBJECT: Department of the Air Force Acquisition and Modernization Programs in the Fiscal Year 2021 National Defense Authorization President's Budget Request

STATEMENT OF:

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Introduction and Strategic Environment

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

As the nature and sources of conflict throughout the globe have become more diverse and less predictable, our Nation continues to face a complex set of current and future security challenges, including the resurgence of great power competition from China and Russia. It is clear that supremacy in the air and space domains—a given for any U.S. military operation since the end of the Cold War—can no longer be presumed without deliberate action. The National Defense Strategy shifted our prioritization to high-end warfighting reflecting this changing nature of warfare.

Today, the Department of the Air Force has fully embraced Secretary of Defense Esper's goal of irreversible momentum toward National Defense Strategy implementation. The Department of the Air Force must be ready to compete, deter, and win in this rapidly changing and increasingly complex security environment; defend the homeland; provide a safe, secure, and effective nuclear deterrent; and be able to defeat a powerful conventional enemy while we deter opportunistic aggression in another theater; and continue to disrupt violent extremists. These missions require an increased focus on modernization in all domains that must be sustained to prevail against the advanced threats we face.

Current Capacity and Capability

In the Fiscal Year (FY) 2021 President's Budget, the Department of the Air Force conducted an exhaustive review of our portfolios and made hard decisions to align with the National Defense Strategy, which includes the acceptance of calculated short-term risks. Some difficult choices require the divestiture of legacy platforms in exchange for investment in capabilities needed for the future. Our decisions are supported by learning from multiple, complex wargames to assess alternative warfighting approaches against a peer adversary. Our modernization investments—focused on connecting the Joint force, dominating in space, generating combat power, and conducting logistics under attack—reflect the new strategic reality.

Safety Implementation and Statistics on Trends

Physiological events and mitigation strategy implementation

The Department of the Air Force remains committed to solving physiological events. We are collaborating with the Navy to increase knowledge and develop technology to mitigate physiologic episodes. Air Force flight surgeons and aerospace physiologists, working with Air Force and Navy aircrew breathing system scientists and engineers, re-wrote MIL-STD 3050, the design criteria standard for Aircraft Crew Breathing Systems, based on lessons learned and system improvements from recent investigations. Following appropriate Department of the Air Force, Navy, Army, and industry review, the standard will be published to improve requirements for aircrew breathing system design. To increase our ability to test On-Board Oxygen Generating System (OBOGS) units, the Air Force Life Cycle Management Center is building an OBOGS facility that will be operational this October. Additionally, the Air Force Research Laboratory is

developing cockpit sensors to obtain inflight physiological data to provide better diagnostic data from OBOGS in flight.

Safety statistics on mishaps and trends

From FY15 to present, Department of the Air Force tactical aircraft (i.e., A-10, F-15, F-16, F-22 and F-35) Class A and B mishaps have remained fairly consistent both in rate and quantity. The FY19 Class A mishap rate of 3.3 was a slight increase over the FY15 to FY19 five year average of 2.7. The FY19 Class B mishap rate of 3.3 was the same as the five year average. Fifth generation aircraft comprise a greater percentage of Class A and B mishaps due to their higher costs. From FY15 to present, thirty-eight percent of the Class A and B Tactical Aircraft mishaps involved 5th generation aircraft despite comprising less than seventeen percent of the tactical aircraft fleet during that period. In FY19, 5th generation aircraft flew eleven percent of total tactical aircraft flight hours; however, they accounted for over forty-six of the tactical aircraft Class A and B mishaps.

Tactical aircraft ejection seat modernization strategy and implementation

As of the end of FY19, the Department of the Air Force approved the acquisition strategy for 2906 Next Generation Ejection Seats to Collins Aerospace for the F-15, F-16, F-22, A-10, and B-1 aircraft. Program enhancements include: height and weight accommodations for female aircrew members; passive restraints and new parachutes reducing spinal and extremity injury risk; and modularity which will decrease aircraft maintenance downtime. We expect to award the contract in July 2020 and start of F-15 qualifications at the end of 2021. While fielding priority and schedule are subject to funding availability, we are seeking ways to incorporate them in the

F-15EX as soon as possible. Next Generation Ejection Seats will begin fielding in tactical aircraft in FY23.

Tactical Aircraft Force Mix and Capacity Issues and Mitigation Strategies

We remain committed to the dual-role F-35 and its game-changing capabilities, while we continue to modernize and sustain our aging legacy fleet. The Center for Strategic and Budgetary Assessments (CSBA) conducted a study in March 2019 called, "An Air Force for an Era of Great Power Competition," which indicates our current fighter force structure of 55 squadrons is too small and not sufficiently postured for great power competition. To restore readiness of the force we must refresh the fighter fleet with a mix of 4th generation and 5th generation aircraft, as well as selectively modernize our existing aircraft, to ensure the right capacity and capability to fully implement the National Defense Strategy.

The Department of the Air Force needs approximately 2,100 fighters to meet current warfighting demands. The Department of the Air Force fighter fleet is aging and some platforms will run out of service life soon. The F-15C/D fleet, a majority of older F-16s, and some A-10s will reach the end of their service life in the next 10 years. Prior to 2010, we planned for these aircraft to be replaced by a larger F-22 fleet and a more rapid F-35 procurement profile. The Department of the Air Force was unable to meet the projected timeline, thus requiring more new fighters in the near term to avoid tactical aircraft shortages and significant readiness issues caused by structurally deficient or obsolete fleets. In order to arrest the retirement rate and grow to the future requirement, the Department of the Air Force must procure 72 new aircraft each year.

Certain wartime environments in the future require the F-35 and other advanced capabilities. The Department of the Air Force remains fully invested in the F-35 program,

including modernization and capability enhancements through the FYDP. The Air Force will continue to buy 48 F-35s per year to meet the planned procurement total. F-35s alone will not be operationally sufficient, or be delivered quickly enough to meet National Defense Strategy requirements. Therefore, this year's budget balances current 4th generation and 5th generation capabilities and capacity, while developing a critical, iterative family of capabilities to ensure air superiority by leveraging digital engineering, agile software methods, and open systems architectures.

F-35

The F-35A is the centerpiece of the Department of the Air Force's 5th generation multi-domain capability and is a critical force multiplier for legacy forces. It directly supports National Defense Strategy objectives to "build a more lethal force" and "strengthen alliances and attract new partners." We remain fully committed to the F-35 program of record of 1,763 aircraft. Our budget requests $6.7 billion in FY21—and $30 billion across the FYDP—to continue production and integrate new capabilities. We expect to have more than 20 combat-ready F-35 squadrons in our inventory by 2030, and to ensure those squadrons are ready to counter future threats, we must field F-35 Block 4 capabilities as quickly as possible.

Last year, the F-35 Program Office awarded a contract to Lockheed Martin for production Lots 12, 13, and 14. With this contract, Lockheed Martin agreed to a Unit Recurring Flyaway (URF) cost of $80 million per aircraft for a USAF F-35A by Lot 13, one year earlier than planned. This year we will work closely with the F-35 Program Office to transition the F-35 Autonomic Logistics Information System (ALIS) to a new system called the F-35 Operational Data Integrated Network (ODIN). ODIN will be designed with government-managed infrastructure and significant operator input to ensure worldwide F-35 operations can be cost-

effectively sustained. We are also aggressively pursuing our goal of accelerating the establishment of organic repair capability in Department of Defense (DoD) depots.

Ultimately, the Air Force must field a robust fighter force—with the F-35 as the quarterback—that is able to detect and defeat the most advanced threats we face.

F-22

With its combination of stealth, supercruise, and maneuverability, the F-22 remains a critical component of our 5th generation air superiority force. The FY21 budget requests $1.22 billion in FY21—and $6.3 billion across the FYDP—for modernizations needed to keep pace with evolving threats. Our Section 804 Capability Pipeline combines former TackLink16, TACMAN and GPS M-code programs to deliver iteratively-improved "slices" of each capability on a regular cadence. Future modernizations will leverage this same rapid prototyping approach to ensure this platform rapidly and iteratively modernizes.

F-15

The F-15C/D supports both Homeland Defense and Air Superiority missions. Our F-15 budget requests $2.6 billion in FY21—and $13.1 billion through the FYDP—to address structural fatigue issues and upgrade obsolescing systems.

The 234 F-15C/Ds in the Department of the Air Force inventory will reach the end of their designed service life in the next six to eight years, and our analysis shows additional service life extension programs are not cost effective. Our plan for replacing this aging fleet with a modernized successor, the F-15EX, is moving forward thanks to Congressional support of last year's budget. We propose to buy 76 F-15EXs over the next five years, allowing us to benefit from over $2 billion in foreign partner investment in the F-15 production line. The decision to

refresh the 4th generation fighter force helps mitigate capacity and readiness risks but is not a substitute for the 5th generation capabilities of the F-35 or F-22.

The F-15E fleet provides all-weather, long-range global precision attack in all but the most-contested threat environments. Our modernization efforts will ensure the F-15E aircraft remains viable through the 2040s. Modernizing the F-15E with the Eagle Passive Active Warning Survivability System (EPAWSS), which will also be installed on the F-15EX, demonstrates our commitment to building a more lethal Air Force. EPAWSS will provide critical electronic warfare capabilities that will allow the aircraft to hold targets at risk in more challenging threat environments.

F-16

The F-16 is the Department of the Air Force's primary multi-role fighter and Suppression of Enemy Air Defense (SEAD) and Destruction of Enemy Air Defense (DEAD) aircraft. This program is in the midst of the largest modernization in its history to extend its operational capabilities through the 2040s. The program adds $853 million in FY21—and $4.0 billion across the FYDP—for a Service Life Extension Program affecting 300 aircraft, consisting of 12 structural modifications including wings, canopy sill longerons, and lowering of the bulkhead for each.

In addition, there are several capability upgrades including the Active Electronically Scanned Array (AESA) Radar that significantly enhances the aircraft's ability to detect, track, and identify low-observable, low-flying, and slow-flying targets. The AESA radars began fielding in 2019 and will complete in 2027.

Our acquisition team is carrying out the modifications to this fleet using innovative approaches, such as organic DevSecOps software development. The team recently demonstrated

the Department of Defense's first employment of a new software technology, called Kubernetes, that will speed software deployment cycles to keep pace with rapidly evolving threats. The team is also fielding the Auto-Ground Collision Avoidance System that executes automated recovery maneuvers to prevent terrain collisions. The system already has already saved nine lives, so we are excited to continue fielding this capability for our warfighters.

A-10

The A-10 is an effective Close Air Support (CAS) platform uniquely suited for countering violent extremist organizations. Our current budget adds $100 million in FY21—and $571.4 million across the FYDP—to modernize the A-10, including $100 million for ten new wings. The new A-10-Thunderbolt II Advanced-Wing Continuation Kit contract awarded in August 2019 and will procure up to 112 new wings to outfit the remainder of the programmed fleet between 2022 and 2028. This will provide each A-10 aircraft approximately 10,000 additional flight hours to remain lethal in the coming decades.

The Air Force Operational Test and Evaluation Center (AFOTEC) is completing Congressionally-mandated F-35 and A-10 comparative testing. Full Initial Operational Test and Evaluation will be completed this year with the final report released shortly thereafter. We are working with the Director of Operational Test and Evaluation to ensure test needs are being met in a timely manner.

Light Attack Aircraft Research, Development, and Procurement

The Department of the Air Force will continue its Light Attack Experimentation efforts in FY21, with a focus on networking capabilities that could be shared more broadly with Allies and Partners, especially for Countering Violent Extremist Organizations. As the Department of the Air Force continues experimentation with two AT-6 and A-29 aircraft, respectively, we will

transfer $1.3 billion to U.S. Special Operations Command to purchase aircraft for its armed overwatch mission, which is a separate effort.

Next Generation Air Dominance System of Systems

The Department of the Air Force is investing in technologies as part of a family of capabilities enabling air dominance in the most challenging operational environments. Air superiority underpins joint force operations in every theater, and evolving threats are forcing us to adapt both how we achieve it and how we build it. The FY21 budget requests $1 billion—and $6.6 billion across the FYDP—for Next Generation Air Dominance (NGAD). As future threats become increasingly difficult to predict, NGAD is employing digital engineering to replace once-in-a-generation, mass-produced fighters with smaller batches of iteratively-upgraded platforms of multiple types. Dubbed the "Digital Century Series," this approach takes a cue from the digital transformation of the automotive industry, using high-fidelity models to troubleshoot design, assembly, maintenance, and cost before physical systems exist. The goal is to end the learning curve cost of modernization so future aircraft—as well as satellites and weapons—can rapidly adapt to changing threats in a way legacy Major Defense Acquisition Programs cannot. We are excited about our progress and look forward to sharing the details with Congress in a classified setting.

Trainers

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

The Department of the Air Force continues to modernize its trainer platforms as a vital component of readiness. We will divest the T-1 fleet starting in FY23 to enable full investment in Pilot Training Next, a new training paradigm that uses immersive technologies, such as artificial reality, to improve how we train pilots. We are investing in

an enhanced On-Board Oxygen Generation System, crash-survivable recorder, and numerous improvements to the T-38 such as front canopy replacements, until the T-7A "Red Hawk" delivers. The T-7A will replace Air Education and Training Command's existing fleet of 427 T-38C aircraft with 351 new trainers including all associated simulators, ground equipment, spares, and support equipment. The T-7A will better prepare student pilots with the skills and competencies required to transition into 4th and 5th generation fighter and bomber aircraft. Our FY21 budget requests $4.5 million, $28.7 million, $43.0 million, and $249 million for the T-1, T-6, T-38, and T-7A fleets, respectively.

Air Force Pilot Training Next initiative and implementation

Pilot Training Next (PTN) uses new technology to build better pilots more efficiently through the use of on-demand/on-command academics, Artificial Intelligence (AI)-enabled learning and competency-based progression. The Department of the Air Force is growing the PTN initiative to the entire enterprise in approximately four years through the rollout of Undergraduate Flight Training 2.5. This program will help augment training as T-1 retirement begins in FY23.

Current and Forecasted Pilot and Aircrew Shortfalls and Mitigation Strategies

As of FY19, the Department of the Air Force is approximately 2,100 pilots short of the required 20,850 Total Force manned pilots. We remain focused on decreasing the shortage of pilots through a combination of production and retention efforts. Training initiatives have enabled the Department of the Air Force to increase Undergraduate Pilot Training (UPT) production from 1,112 in FY16 to an estimated 1,300 graduates in FY20. This year's goal is 1,480 pilots.

Increased UPT production is a key component of the pilot recovery plan; however, achieving pilot manning health also requires robust and effective retention efforts to ensure we have a sustainable force. While Initial Aviation Bonus acceptance rates have stabilized at forty-four percent over the last three years after a steady decline between FY13 and FY17, rates are still below the necessary levels. To further increase retention, we are focusing on improving both quality of service and quality of life, and reducing administrative burdens in operational squadrons, the number of 365-day deployments, and the deployment of limited specialties to staff assignments.

Rotorcraft

The FY21 budget continues investment in the Department of the Air Force's critical rotorcraft modernization programs, including the CV-22 Osprey, HH-60G, HH-60W Jolly Green II, and MH-139A Grey Wolf programs.

The FY21 budget requests $147.3 million for the CV-22 fleet to support our special operations forces. The Department of the Air Force continues to make improvements to the CV-22 with modifications to improve reliability, survivability, and capability. Future efforts will make CV-22 sustainment more cost-effective while ensuring the viability of its unique long-range payload capacity coupled with vertical take-off and landing flexibility.

The Department of 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 and night Combat Search and Rescue operations to recover isolated personnel in hostile or permissive environments. Due to the advancing age and current attrition rates of the HH-60G, the Department of the Air Force must continue to modify existing HH-60G helicopters while using the Operational Loss Replacement program to

meet Combatant Command requirements until we can fully recapitalize with the HH-60W Jolly Green II. The FY21 budget requests $46.4 million and $1.2 billion for the HH-60G and HH-60W programs, respectively. This budget request adds 19 HH-60W aircraft, increasing the total to 76 HH-60Ws within the FYDP. Testing of the new HH-60W Jolly Green II is progressing on schedule to support the next acquisition program milestone, Required Assets Available, by April of 2021.

The MH-139A helicopter is a critical element of both Department of the Air Force nuclear modernization and operational airlift within the National Capital Region. Last December, the Department of the Air Force received its first MH-139A to initiate developmental testing with first flight on 11 February 2020. The program will deliver up to 84 replacement helicopters, training devices, and associated support equipment to replace the legacy UH-1Ns. The FY21 budget requests $256.9 million for the MH-139A program, which will fund the continued integration of non-developmental items, non-recurring engineering work required to certify the modified air vehicle, initiation of the test program, and procurement of 8 MH-139As for low rate initial production.

Munitions

While the operational demand for munitions continues, our FY21 budget requests funds to replenish expenditures and enable sufficient production to reach desired inventory levels. This budget request also funds more lethal weapons to meet future operational requirements in support of the National Defense Strategy. Thanks to the strong support of Congress, our munitions posture continues the previous gains in munitions and emphasizes the advanced munitions most-relevant to the high-end fight.

The Advance Medium-Range Air-to-Air Missile (AMRAAM) is our premier air-to-air missile providing the air dominance the Joint Force requires. The FY21 budget requests $453 million for 414 missiles, including obsolescence mitigation through the Form Fit Function Refresh (F3R) at the end of FY21. This budget request continues to ramp production through FY25.

The Joint Air-to-Surface Standoff Missile (JASSM) is our premier standoff air-to-ground missile for holding threats in highly-contested environments at risk. The FY21 budget requests $506.4 million to procure 400 missiles, which includes the introduction of our first AGM-158D JASSM missiles, incorporating weapon enhancements and obsolescence mitigation in a single update. With Congressional support, the JASSM production facility expansion which began in 2019 will enable up to a forty-seven percent increased production rate by 2025.

The Stand-In Attack Weapon (SiAW) is a new air-to-ground weapon for our penetrating systems to defeat the rapidly relocatable targets that enable adversary contested environments. The FY21 budget requests $160.4 million—and $1.06 billion across the FYDP—to develop this new system.

The Joint Direct Attack Munition (JDAM) is our high-quantity, air-to-ground weapon of choice because of its accuracy, reliability, and effectiveness. The JDAM program delivered over 46,000 guidance tailkits in FY19 to meet the needs of the Joint Force and Foreign Military Sales (FMS) partners. The Department of the Air Force also received an Urgent Operational Need (UON) for an advanced variant, known as SABR-Y, which incorporated enhanced GPS jamming resistance. We plan to order 25,000 tailkits in FY20 with future procurements shifting completely to the advanced SABR-Y variant. The FY21 budget requests $448 million for 10,000 tailkits to maintain desired inventories.

Small Diameter Bomb I (SDB I) provides reduced collateral damage and increased load-outs per sortie. The Department of the Air Force had increased production in previous fiscal years to replace depleted stockpiles, but as we approach desired inventory levels, procurement is being reduced to match operational need. The FY21 budget requests $96 million for 2,462 weapons, making the remaining production capacity available to FMS partners.

The SDB II program, which provides improved capability against mobile targets, completed Initial Operational Test and Evaluation in FY19. The FY21 budget requests $273 million to procure 1,133 weapons. We look forward to fielding this system and providing warfighters improved standoff, target flexibility, and resilience to adverse weather conditions.

Hellfire missiles provide a direct strike capability for our remotely-piloted aircraft and remain in high demand for day-to-day operations. The FY21 budget requests $184 million to procure 2,497 Hellfire missiles to meet operational requirements.

Intelligence, Surveillance, and Reconnaissance and Advanced Battle Management System

Intelligence, Surveillance, and Reconnaissance (ISR) is critical to our national security, now and in the future. As we maintain current systems, we must meet the challenges of a highly-contested environment. Consequently, our FY21 budget funds a future ISR portfolio with multi-domain, multi-intelligence capabilities, many of which must remain classified to maintain our advantage against peer adversaries. We appreciate Congressional support and willingness to meet in classified fora to understand and oversee these efforts.

The most critical element of maintaining ISR, and more broadly warfighting dominance, is the Advanced Battle Management System (ABMS). Charged by the Secretary of Defense with leading concept development for Joint All-Domain Command and Control, the Department of

the Air Force is building a militarized internet of things (IoT), called ABMS, to connect any sensor with any shooter—across all domains—with the required digital infrastructure for data analytics and artificial intelligence to fight at machine speeds.

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

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

Our Department of the Air Force FY21 budget request includes additional resources for ABMS and its digital backbone (Enterprise Information Technology as a Service) comprised of 28 development projects, such as the aforementioned gatewayONE, and continued experimentation. Sponsored by U.S. Space Command, U.S. Northern Command, and U.S. Strategic Command the next experimentation event is planned for this April. We are committed to working with our Joint and Allied Partners so that existing systems can join easily. We ask

Congress to continue to support this capability so that future operators on the battlefield enjoy the same empowered connectivity they presently enjoy at home.

As we build ABMS, we must also sustain and modernize existing platforms to connect with it. The E-3 and E-8C aircraft fleets currently provide airborne command and control and Moving Target Indication capability for operations outside of the contested environment. Our FY21 budget continues to invest in the E-3 fleet through multiple upgrades, including the Block 40/45 mission system upgrade, the DRAGON flight deck modernization, and Mobile User Objective SATCOM radio integration, to ensure it can continue to support current operational requirements, meet air traffic control mandates, and sustain availability rates. For the E-8C, the Department of the Air Force continues to implement efforts to increase operational availability and ensure aircraft viability into the future. Our FY21 budget funds Common Data Link integration and procurement of modern ARC-210 Gen 6 radios. We remain committed to providing six deployed E-8C aircraft to meet Combatant Commander needs.

MQ-9s have played an invaluable role in the fight against Violent Extremist Organizations, but consistent with the National Defense Strategy, we must begin retiring these aircraft to free resources for next-generation capabilities. Our FY21 budget request retires ten MQ-9 combat lines—reducing annual operations and maintenance costs by $237 million—and shuts down the production line in FY21. The production line shutdown will save $563 million across the FYDP, freeing funds for next-generation systems, while still providing sufficient MQ-9 inventories to support combat requirements into the 2030s. While reducing quantity, our budget request includes $679 million to improve the quality of the fleet. Modernizations include a new Full Motion Video sensor, range enhancements, and automated take-off and landing.

Additionally, the MQ-9 program is mitigating the operational and maintenance impacts of sustaining a multi-configuration fleet by moving to a Block 5-only fleet operated solely by Block 30 Ground Control Stations.

The RC-135 fleet provides important signals intelligence in support of operations and in uncontested environments. Our FY21 budget requests $280 million for fleet-wide improvements such as automation of additional search and detection, improved near-real-time data processing and distribution, and artificial intelligence-aided data exploitation. Our partnership with the United Kingdom's Royal Air Force on the RC-135 continues to set the standard for cooperative efforts that strengthen alliances while increasing partner interoperability.

The RQ-4 Global Hawk provides high-altitude, long-endurance, all-weather, wide-area reconnaissance and surveillance. In support of the National Defense Strategy, we will divest our four Block 20 aircraft and the twenty RQ-4 Block 30 aircraft to free resources for systems capable of operating in contested environments. While this decision will save $2.45 billion total over the FYDP, including $815 million in investment dollar savings alone, the decrease in fleet size does not lessen our commitment to modernizing and sustaining the remaining 10 Block 40 aircraft. The FY21 budget request includes ground segment modernization and upgraded communications interoperability to ensure these platforms continue to provides Ground Moving Target Indicators in support of joint operations.

The U-2 provides ISR in support of missions in multiple theaters. The FY21 budget will retain the U-2 through FY25 as we develop new systems.

The Tactical Data Network Enterprise (TDNE) program moves data across our ISR enterprise and contains multiple development efforts directly supporting JADC2. This includes

Software-Programmable Open Mission System Compliant (SPOC) radios capable of hosting a variety of advanced non-proprietary waveforms while also ensuring backward compatibility and a gateway that will provide data-sharing capability between 5th and 4th generation platforms. It is critical that all programs and platforms prepare for integration with ABMS to ensure data can flow between any sensor and shooter at machine speeds.

It is critical that these ISR systems, and other platforms, prepare for integration with ABMS to ensure data can flow between any sensor and shooter at machine speeds. As we continue our four-month integration exercises for ABMS, we are committed to keep Congress informed on progress to build confidence the approach and deliver this important capability for the future fight.

Faster, Smarter Acquisitions and Future Capability

Competing against rising peer adversaries during this time of unprecedented technology change requires a competitive acquisition system: one that is faster and more agile than our rivals. Consequently, the Department of the Air Force is transforming what we buy, how we buy, and who we buy from to retain the battlefield dominance we presently enjoy. In addition to JADC2 powered by ABMS—the backbone of the future Joint Force—there are numerous future-oriented efforts helping us stay ahead of evolving threats.

Faster Acquisitions

Fielding systems faster is step one. Through rapid prototyping authorities granted by Congress, such as Middle Tier Acquisition, we are trimming non-value-added steps that previously bogged down programs and slowed capability to warfighters. In May 2019, we achieved our goal of removing 100 years of excess time from program schedules. Since then, we have reached 125 years on our way to 150 this summer. Rapid prototyping—"flying before you

buy"—is not just a faster acquisition approach; it allows risks to be tackled earlier, before systems are in production when there is still time to troubleshoot. The benefit is proving out in our 55 MTA programs, which maintain the same documentation and discipline as traditional programs. We thank Congress for this invaluable authority and will continue to report our status regularly.

DevSecOps software development is fundamentally changing how we deliver digital capabilities to warfighters. With the establishment of our Program Executive Office for Digital, Chief Software Officer, and over 60 agile coding teams spanning both traditional programs (e.g., F-16, F-22, and B-21) and new development "factories" (e.g., Kessel Run, Kobayashi Maru, Space Camp, and LevelUp) the Department of the Air Force is scaling modern software practices where cycle times are now weeks, even days. Kessel Run, a fantastic example of what Section 804 authorities helped accomplish, has deliver 26 capabilities to over 10,000 users in the Air Operations Centers that are updated every 11 hours on average. To accelerate even further, we are fielding common infrastructure that all programs can leverage. Cloud One, our enterprise cloud, and two coding platforms, Platform One and the Kessel Run platform, currently provide enterprise-wide coding environments employing leading commercial technologies, such as containerization and Kubernetes, increasing the reliability and security of our code. Programs like F-16, F-22, B-21, and Ground-Based Strategic Deterrent (GBSD) are leveraging this pre-accredited infrastructure to develop faster and more securely.

Another accelerant is digital engineering, which is revolutionizing the design and production agility of new programs like T-7A, GBSD, and NGAD. The aforementioned "Digital Century Series" is the Department's first attempt to leverage this technology to build smaller batches of upgradable systems to provide the future Force greater ability to ingest technology.

Another accelerant is our new Vanguard program: a new initiative designed to accelerate technology from our Air Force Research Laboratory into programs of record, modeled after the prototyping process used by the Strategic Capabilities Office. We recently approved the first three vanguards: Navigation Technology Satellite 3 (NTS-3), Skyborg, and Golden Horde.

NTS-3 is the first Satellite Navigation (SATNAV) space experiment in 40 years. The program will develop advanced techniques to provide military, civil, and commercial users with a more resilient SATNAV capability. If successful, these techniques will transition to future generations of the Global Positioning System (GPS) satellites and receivers. Launch of NTS-3 is currently projected for 2023 with a planned one-year, on-orbit experimentation program.

Skyborg integrates Artificial Intelligence (AI) with autonomous Unmanned Air Vehicles (UAVs) to enable manned-unmanned teaming. AI technologies, ranging from simple algorithms to fully autonomous flight controls, will be worked in partnership with our AI Accelerator at the Massachusetts Institute of Technology. If successful, Skyborg will transition AI-enabled low-cost attritable aircraft technology (LCAAT) via the NGAD program or new program of record. The first LCAAT, the XQ-58A Valkyrie, has already demonstrated high subsonic speeds at operationally relevant altitudes and payload capacities. Its next flight in April 2020 will connect the F-22 and F-35 via the gatewayONE radio link as part of the next ABMS demonstration.

Golden Horde will demonstrate collaborative, semi-autonomous networked weapons that share data, interact, and execute coordinated actions to defeat targets. Golden Horde will leverage onboard radios and algorithms to share data between weapons as well as manned platforms. Flight testing with existing weapons will begin this year, and, if successful, those weapons programs will transition Golden Horde upgrades into their respective programs of record.

Smarter Acquisitions

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

Another area of smarter acquisition is our work with startups, small businesses, and private investors. With over eighty percent of our nation's research and development (R&D) now commercial—and our Defense Industrial Base continuing to shrink through mergers and acquisitions—transforming the way we work with commercial companies is imperative. In 2018, we began energizing our Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR) to lower barriers for commercial tech companies, speed

contracts, and bring private investment into the Defense market. In 2019 alone, we awarded over 1,000 contracts worth $240 million to 700 companies, with over half new to the government; conducted 15 “Pitch Days” that awarded $77 million in same-day contracts; and induced over $400 million of private investment matching for companies receiving Department of the Air Force awards. With more improvements coming this year, we will formally launch this new “Air Force Ventures” process at scale so that tech companies can depend on us as an early innovation partner of choice.

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

Conclusion

Thank you again for the opportunity to testify before this Subcommittee. The dialogue we have today will help us design, build, and operate a force capable of fighting and winning now and in the future. Our adversaries are not standing by idle; neither must we.