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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 2020 National Defense Authorization President's Budget Request

STATEMENT OF:

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Introduction

Chairman Norcross, Ranking Member Hartzler, and distinguished members of the subcommittee, thank you for the opportunity today to provide testimony on Air Force acquisition and modernization programs in the FY2020 National Defense Authorization President's Budget. The Air Force is in the midst of modernizing nearly every platform in our inventory. We appreciate congressional support as we modernize our platforms to meet operators' most pressing needs. What never strays far from our minds is the need to win the war for the future. We are entering an era of great power competition and we will not remain superior if we cannot build and field faster than other militaries.

Over the past year, the Air Force has made great strides to supercharge its acquisition engine – stripping nearly one century out of acquisition program schedules – by fully embracing congressional authorities to rapidly prototype and by tailoring acquisition approaches to fit programs' unique needs. Threaded throughout the programs discussed in this testimony are examples of acquisition best practices that are producing better results and meeting warfighter needs faster. Program Managers of major acquisition programs have challenged necrotic, traditional acquisition approaches and have flipped the script to accelerate programs using section 804 authorities. Programs are collaborating with a wider range of industry partners to do business at the speed of ideas, something we hope to increase with our Air Force Pitch Days.

Additionally, agile software development practices are becoming more widespread across a variety of mission areas. The FY2020 National Defense Authorization President's Budget request supports modernization efforts of top priority to our warfighters. As important, it enables us to continue to push new acquisition tools to keep our feet firmly planted on the accelerator to improve all of our current and future acquisition programs.

Safety Implementation and Statistics on Trends

Physiological events and mitigation strategy implementation

We remain committed to solving physiological events across the Air Force and joint services. The last update to MIL-STD 3050, the DoD Design Criteria Standard for Aircraft Crew Breathing Systems with Onboard Oxygen Generating Systems, was in 2015. It is being updated to reflect lessons learned and system improvement from recent investigations. There is an immediate funding requirement to collect and assess Air Force-wide data to help validate requirements for new acquisitions. We have requested funds to acquire physiological sensors as we have minimal physiological data on pilots while flying compared to robust aircraft system data. Currently, Air Combat Command is partnering with NASA, the U.S. Navy, and industry partners; while leveraging commercial expertise from Google, Amazon, Microsoft, and others to establish in-flight physiological monitoring requirements to mitigate physiological events as a method to alert aircrew to Hypoxia or Hypoxia-like conditions that impact physiological performance.

Safety statistics on mishaps and trends

From FY14 to present, Air Force tactical aircraft Class A and B mishaps have remained fairly consistent both in rate and quantity. The Class A mishap rate slightly increased over the FY14 to FY18 period five year average (2.34) with a rate of 2.69 in FY18. The Class B mishap rate decreased over the five year average (3.78) with a rate of 2.92 in FY18. Due to their higher costs, fifth-generation aircraft increasingly comprise a greater percentage of Class A and B mishaps. From FY14 to present, 33% of the Class A and B Tactical Aircraft mishaps involved fifth-generation aircraft, although they comprised less than 19% of the tactical aircraft fleet

during that period. In FY18, fifth-generation aircraft flew 15% of total tactical aircraft flight hours, but accounted for over 50% of the tactical aircraft Class A and B mishaps.

Ejection seat modernization strategy and implementation

The Next Generation Ejection Seat (NGES) program to upgrade the seats in the Air Force's F-16, F-15, F-22, B-1, and A-10 fleets, is on track to begin testing in FY21. The Program Executive Officer will determine the specific acquisition strategy in the upcoming weeks. The program schedule aligns with the FY20 President's Budget Request which includes \$10 million in FY21 to fund the initial qualification testing efforts. Funding allotted prior to FY21 has been used to conduct risk reduction activities and acquisition strategy planning support.

The NGES program plans to release a draft request for proposal (RFP) in April followed by the final RFP later in FY19. Additionally, we are fully prepared for an FY21 start, and postured to execute early if additional funding becomes available.

Fighter Force Structure

We remain committed to the dual-capable F-35 and its game-changing capabilities, while we continue to modernize and sustain our aging legacy fleet. However, our current fighter force of 55 squadrons is too small. To restore readiness of the force, we must refresh the fighter fleet with a mix of 4th and 5th generation aircraft to ensure the right capacity and capability to fully implement the National Defense Strategy.

The Air Force needs approximately 2,100 fighters to meet current warfighting demands. Force structure studies project that number to increase. The current Air Force fleet is aging and some platforms will run out of service life soon. The F-15C/D fleet, a majority of older block F-

16s and some A-10s will reach the end of their service life in the next 10 years. In order to arrest the retirement rate and grow to the future requirement, the Air Force would need to procure 72 new aircraft each year.

Certain wartime environments in the future require the F-35 and other advanced capabilities. The Air Force remains fully invested in the F-35 program, including modernization and capability enhancements through the FYDP. The Air Force has not changed its planned total procurement of the F-35, and will buy 48 aircraft per year through the FYDP. No funding was taken from this program to go towards the funding for the 4th generation refresh.

To procure 72 aircraft per year while balancing other priorities, we need additional 4th Generation aircraft to refresh our aging fleet. Although 5th Generation fighters are more capable in several respects, there are a wide array of existing missions 4th Generation fighters can satisfy. The F-15EX is the most cost-effective and immediate way to refresh capacity, reduce operating costs, and improve the capability of the existing 4th Generation fleet. The F-15EX can refresh existing bases with minimal MILCON, and no extensive pilot and maintenance retraining. Our budget requests the funding to buy 80 aircraft over the next five years.

F-35

The F-35A is the centerpiece of the United States Air Force's 5th generation multi-domain capability and it is a critical force multiplier for legacy forces. We remain fully committed to the F-35 program of record of 1,763 aircraft. Our budget requests \$6.5 billion in FY20, and \$31.7 billion across the FYDP, to continue production and integrate vital capabilities. We expect to have over 20 combat-ready F-35 squadrons in our inventory by 2030. To ensure those squadrons are ready to achieve

National Defense objectives in future threat environments, we are working to field full F-35 Block 4 capabilities as quickly as possible.

Our budget decreases the F-35 buy profile by 18 aircraft between FY20 and FY23 in order to align the procurement timeline with capability development and reduce retrofit costs. In addition, we continue to focus on ensuring Autonomic Logistics Information System (ALIS) operates as intended: 1) ALIS must fully operate as intended; 2) F-35 Reprogramming Enterprise must update F-35 Mission Data Files at the speed of war to ensure operational relevancy; and 3) F-35 simulator must be current with fielded aircraft operational flight programs, have sufficient fidelity to provide effective training, and be distributed mission operations network capable.

We are taking a phased approach to achieve 80% mission capable (MC) rates by September 2019 in our combat coded F-35s by addressing prioritized efforts to improve supply chain performance, reduce depot span time, accelerate modifications, and optimize unit level performance. Combat coded aircraft at Hill AFB were at 64.5% MC ending February.

F-22

The F-22 is the only operational multi-mission air superiority fighter aircraft that combines stealth, supercruise, maneuverability, and integrated avionics to make it the world's most capable air superiority aircraft. The F-22 request adds \$953 million in FY20, and \$5.2 billion across the FYDP, for modernization efforts essential to gain and maintain air superiority against evolving threats. The Capability Pipeline, a Section 804 program, combines former TackLink16, TACMAN and GPS M-code programs to deliver slices of each capability on a regular cadence to the field. Future modernizations will leverage the "Capability Pipeline" as a vehicle to rapidly prototype and iteratively field critical enhancements with capabilities delivered

to the fleet on a regular cadence and ensure first look, first shoot, and first kill capability in highly contested environments.

As you are all aware, our F-22 fleet was significantly impacted after Hurricane Michael struck Tyndall AFB, Florida. All aircraft that sustained damage from the hurricane, with the exception of three, have been returned to serviceable condition. Of the three still undergoing repair, two are undergoing stabilizer and flap repairs at Eglin AFB, Florida with estimated completion dates in April and May. The third aircraft is undergoing structural repairs, as well as routine scheduled depot maintenance, at Hill AFB, Utah with a scheduled completion date in September.

Thirty-one F-22 aircraft attached to the 43rd Fighter Squadron have relocated to Eglin to continue flying training unit (FTU) operations. Challenges include the relocation of support personnel, equipment, access to facilities and aircraft parts. The movement of aircraft parts from the Tyndall supply warehouse to Eglin is expected to be complete by 1 April 19. Additionally, the F-22 aircraft have been unable to undergo needed low observable (LO) maintenance, negatively impacting fleet LO health and driving all aircraft to non-mission capable, but flyable status. Two LO spray bays at Tyndall were recently returned to service enabling routine LO maintenance operations to improve fleet health. Eglin and Tyndall leadership teams have also coordinated the use of a spray bay located at Eglin to further expand capacity and accelerate LO recovery.

The 24 aircraft assigned to the 95th Fighter Squadron have been redistributed to Joint Base (JB) Langley-Eustis, Virginia; JB Elmendorf-Richardson, Alaska; and JB Pearl Harbor-Hickam, Hawaii. Five of the 24 are currently undergoing routine depot maintenance. Ten aircraft were reassigned to Langley, which facilitated a loan of three aircraft to Nellis AFB,

Nevada to meet mission requirements. Elmendorf and Hickam each received seven aircraft. The additional aircraft are expected to provide increased efficiencies in mission execution and improved unit readiness. Personnel and equipment needed to support the additional aircraft at each site are still in the process of relocating, which is expected to occur through August.

As would be expected, the MC rate of the F-22s slowed due to Hurricane Michael's impacts. The fleet MC rate of 67.4% is up just over one percent since the start of the fiscal year. For example, a ~35% reduction in flying contributed to some of the supply rate improvement due to a reduced demand signal. Still, combat coded fleet supply rate did improve from 20% in August 18 to 10.6% as of mid-March 19. However, gains are offset by a maintenance of 27.1% for February 19, mainly driven by LO work.

F-15

The F-15C/D supports both Homeland Defense and the air superiority mission. Our F-15C fleet is aging, with two-thirds of the fleet past its designed service life. The 234 F-15Cs in 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 budget proposes to replace our aging F-15C fleet with a modernized successor by purchasing the F-15EX. We propose to buy 80 aircraft across the next five years. This allows us to benefit from foreign partner investments in the F-15 line to begin a cost-effective replacement of our F-15C fleet. The Air Force remains fully committed to advanced 5th generation capabilities and the F-35. The decision to refresh the 4th generation fighter force helps mitigate capacity risk while balancing near term readiness concerns.

The F-15E fleet provides all-weather, long range global precision attack in all but the highest threat environments. Our F-15 budget requests \$2.1 billion in FY20, and \$12.6 billion

thru the FYDP, to continue modernization efforts to ensure the aircraft remains viable through the 2040s. Modernizing the F-15E with Early Passive Active Warning Survivability System (EPAWSS) demonstrates our commitment to building a more lethal Air Force. EPAWSS will allow the F-15E to attack targets in high threat environments that the aircraft cannot currently engage.

F-16

The F-16 is the Air Force's primary multi-role fighter and Suppression of Enemy Air Defense (SEAD) aircraft. This program is in the midst of the largest modernization period in program service history in order to remain operationally capable through the 2040s. The program adds \$443 million in FY20, and \$3.8 billion across the FYDP, for modifications to ensure the F-16 can operate and survive in today's threat environment. Major efforts in this year's budget include a service life extension program comprising 12 structural modifications, effecting 300 aircraft, with the biggest structural changes being wings, canopy sill longeron, and lower bulkhead. In addition, there are several avionics capability upgrades including the Active Electronically Scanned Array (AESA) Radar upgrade, this replaces the current mechanically scanned radar, with greater ability to detect, track, and identify low-observable, low-flying, and slow-flying target. This joint emerging operational need is critical for the F-16 platform to meet aerospace control alert mission requirements in order to properly defend the homeland against modern threats, these radars will begin fielding in 2019.

Another key avionics capability upgrade is Auto-Ground Collision Avoidance System (AGCAS) that prevents most controlled flight into terrain by executing an automated recovery maneuver to avoid collisions. The AGCAS system already has eight confirmed saves on F-16 block 40/42/50/52 aircraft. Working with Air Force Research Laboratory we were able to

integrate this capability on F-16 Block 25/30/32 analog flight control computers when completed. We are excited to continue fielding this life saving capability for our warfighters.

As of 1 March 2019 F-16s were at 71.9% MC, about four percent higher than when we started the fiscal year. We have begun realizing positive impacts from our initial sustainment surge to push parts to the field and through the depot repair lines. As a result, the field's not mission capable supply rates have dropped from 14% in September to 11.4% in February. Further decreases in supply rates are anticipated through the summer as spares investment continues to deliver in greater numbers.

A-10

The A-10 is an effective close air support platform for the current counter violent extremist organization fight. Our analysis anticipates that, without further wing funding, aircraft groundings due to wing lifespan will begin in FY21, with at least 26 aircraft grounded by FY23. To maintain the A-10 fleet, we must continue to replace the wings to ensure the A-10 remains operationally capable through the 2030s. Our current budget requests an additional \$174 million in FY20, and \$780.3 million across the FYDP to modernize the A-10, including \$100 million for 10 more wings. The new wing contract is currently in source selection with contract award planned for late FY19.

Ongoing Operational Test and Evaluation Efforts and Results

The 2016 and 2017 National Defense Authorization Acts restrict retiring or divesting A-10s until completion of the F-35 Initial Operational Test and Evaluation comparative tests and associated reports, and these are briefed to the Defense Congressional committees. The Comparative Tests are scheduled to complete in Fall 2019, with Initial Operational Test &

Evaluation and Air Force reports complete Spring 2020. Preliminary results indicate that the F-35 is a valuable close air support asset and it makes other participants in the mission better.

Light Attack

The Light Attack effort supports the National Defense Strategy second line of effort for our allies and partners, finding ways to increase their ability to contribute to the counter-violent extremist fight. The Light Attack Experiment taught us important lessons we would not have learned through a traditional acquisition process. The experiment sought to test whether an existing commercial aircraft could perform as a combat capable and cost-effective platform to support the global campaign to counter violent extremist organizations. Key to the experiment was the demonstration of an exportable information-sharing network that will improve interoperability with allies and partners. Based on available aircraft that met experimental criteria, we focused last year on only one aircraft type.

With the Light Attack effort being additive to the Air Force's topline, the FY20 budget requests \$35 million, and \$1 one billion across the FYDP to expand the experiment in this budget to include additional aircraft types (rotary, unmanned, turbojet) and technologies. Additionally, we intend to continue our close partnership with industry and allies to further this technology as we determine the best strategy going forward. We remain committed to developing a cost-effective and increasingly networked counter-violent extremist capability to deepen these partnerships and directly support the National Defense Strategy.

Next Generation Air Dominance

The Air Force is investing in technologies as part of a family of capabilities enabling air dominance in the most challenging operational environments. The requirement to establish and maintain air superiority within the battlespace cannot be understated – it underpins the joint force

operations in every theater. Air superiority remains a core function of the Air Force, however is not a birthright, and given threat advances, cannot be assumed. Next Generation Air Dominance, (NGAD) is our program that supports studies, analyses, technical maturation, and prototyping activities leading to enhancements in lethality, survivability, interoperability, and persistence to ensure air superiority.

This budget requests \$1 billion in FY20 and \$6.6 billion across the FYDP to fund the continued development of a next generation open mission system architecture, advanced sensors, cutting-edge communications using open standards, and integration of the most promising technologies into the family of capabilities. Furthermore, this program incorporates novel agile acquisition practices through its competitive industry consortium approach that is yielding favorable results and provides greater value for the taxpayer. Our efforts are being shaped by multiple analyses, including recommendations from the CSAF approved Air Superiority 2030 Flight Plan, recently completed NGAD Analysis of Alternatives, and several others from renowned analytic organizations. Continued investment in NGAD technologies is critical to ensuring continued air dominance within emerging threat environments for all future joint operations.

Trainers

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

The Air Force is continuing investment efforts in its trainer platforms, including modernization programs for the T-1, T-6, and T-38 fleets. The T-1A Avionics Modernization Program will modernize the T-1A fleet and address known obsolescence and diminishing manufacturing supply issues. The Air Force is completing installation of Automatic Dependent Surveillance-Broadcast (ADS-B) Out across the entire T-6 fleet, modernizing the Aircrew

Training Devices and Crew System life support equipment, and providing logistics support. Additionally, research and development activities will be funded for the Next Generation On-Board Oxygen Generation System (OBOGS) to improve the safety of pilot training and address on-going physiological events in the T-6 aircraft. Modifications are also required to sustain and upgrade the T-38C fleet, including Pacer Classic III, Talon Repair, Inspection, Maintenance, and front canopy replacement programs until T-X is delivered. The FY20 requests are \$26.8 million, \$13.0 million, and \$37.9 million for the T-1, T-6, and T-38 fleets, respectively.

T-X

The Advanced Pilot Trainer (T-X) contract was awarded to the Boeing Company on September 27, 2018. The budget request in the FYDP has been reduced to reflect the approximate \$10 billion cost savings realized from the original program cost estimate. T-X replaces the Air Education and Training Command's existing fleet of 429 T-38C aircraft with 351 aircraft and associated simulators, ground equipment, spares, and support equipment. The T-X will provide student pilots with the skills and competencies required to be better prepared to transition into 4th and 5th generation fighter and bomber aircraft. The FY20 request of \$348.4 million continues the program's Engineering and Manufacturing Development effort, ensuring we meet a 2024 Initial Operational Capability and 2034 Full Operational Capability.

Air Force Pilot Training Next initiative and implementation

Air Force Pilot Training Next is an initiative that brings training processes from the industrial to the information age by integrating new and emerging technologies and individualizing access to learning in order to capitalize on the talents of teachers and learners. Specifically, it introduces a path to next-generation learning through the use of virtual and augmented reality, advanced biometrics, artificial intelligence, and data analytics in order to

optimize learning, individualize training, and expedite the program to the speed of the learning. PTN is currently comprised of 26 students from across the Air Force (9), Navy (2), Air National Guard (2), UK Royal Air Force (1), current/former RPA pilots (7), and enlisted airmen (5). The overall goals of PTN are to 1) create tagged and structured data for future artificial intelligence / machine learning (AI/ML) analysis, 2) improve the IP and student experience, and 3) provide off-ramps to graduate students based on competence, not time.

Current and Forecasted Pilot and Aircrew Shortfalls and Mitigation Strategies

As of FY18, the Air Force was approximately 2,000 pilots short of the required 21,000 Total Force manned pilots. The Air Force is making progress with increased production and leveled retention rates. Current pilot training initiatives have enabled the AF to increase Undergraduate Pilot Training (UPT) production from 1,211 pilots in FY18, to a projected output of 1,480 pilots in FY20. Increased UPT production is a key component of the pilot recovery plan, but achieving pilot manning health also requires robust and effective retention efforts to ensure we have both the correct size and shape of the force. To improve aircrew retention, the Air Force is focusing on improvements to both quality of service and quality of life. Examples to date include modernizing and creating transparency in the assignment process and providing additional support in squadrons to allow aircrew to focus on primary duties.

Rotorcraft

The FY20 Budget continues investment in the Air Force's critical rotorcraft modernization programs, including the CV-22 Osprey, HH-60G, Combat Rescue Helicopter (CRH), and UH-1N Replacement programs.

CV-22

The FY20 PB requests \$83.3 million, and \$760.7 million across the FYDP, for the CV-22 fleet to assist in execution of the National Military Strategy by providing transformational mission capability to special operations forces warfighters. The Air Force continues to make improvements to the CV-22 with modifications designed to improve reliability, survivability, and capability. Future efforts will make the CV-22 more cost-effective while ensuring the viability of its unique long-range payload capacity coupled with vertical take-off and landing capability.

HH-60G and 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. Due to the advancing age and current attrition rates of the HH-60G, the Air Force must continue to modify existing HH-60G helicopters while utilizing the Operational Loss Replacement program to meet Combatant Command requirements until we can fully recapitalize with the Combat Rescue Helicopter (CRH) program. The CRH will be specifically equipped to conduct CSAR across the entire spectrum of military operations. The FY20 Budget adds one test aircraft to bring the total fleet to 113 air vehicles. The Air Force has fully funded the CRH program to meet National Military Strategy objectives through Personnel Recovery missions. The FY20 Budget requests \$22.7 million and \$1.1 billion for the HH-60G and CRH programs, respectively.

UH-1N

The UH-1N Replacement helicopter is an element of the Air Force nuclear enterprise reform initiatives and also supports operational airlift within the National Capital Region. Last September, the Air Force awarded the \$2.38 billion fixed price UH-1N Replacement contract. This contract will deliver up to 84 replacement helicopters, training devices, and associated support equipment to replace the legacy UH-1Ns. The FY20 Budget requests \$171 million for the UH-1N Replacement Program, which will fund the continued integration of non-developmental items, the non-recurring engineering work required to certify the modified air vehicle, and preparations for the test program. The first two test aircraft will deliver in the first quarter FY20.

Open Skies Treaty Aircraft Recapitalization Program

The Open Skies Treaty Aircraft Recapitalization program will design and develop a new weapon system from two missionized, small airliner class commercial-derivative aircraft. The Acquisition Strategy was approved in September 2018 to pursue a full and open competition via a Section 804 rapid fielding approach. This is the fastest path to treaty certification in the fourth quarter FY22 and saves 20 months of schedule to the second and final aircraft delivery. To support this timeline, the Air Force released the draft RFP on 28 February 2019 and plans to release the final RFP in late April 2019 with contract award in February 2020.

Munitions

While operational demand for preferred munitions continues, so do our efforts to secure sufficient inventories for our warfighters. During the last several years, we have successfully ramped up production capacity across the portfolio, and our FY20 Budget Request funds preferred munitions to industrial production capacity. Thanks to strong Congressional support

and funding, this budget continues to improve on significant FY19 munitions gains and emphasizes the advanced munitions most relevant to the high-end fight.

Consistent with prior budgets, the FY20 request again leverages increased base budget and Overseas Contingency Operations (OCO) funding to rebuild inventories and replenish the large number of munitions expended to counter violent extremist organizations around the world. Additionally, this budget also requests funding to develop more lethal weapons capabilities to meet future operational requirements. As we continue working to synchronize munition inventories with National Defense Strategy objectives, the Air Force is grateful for the continuing Congressional support to confront these challenges. To ensure success, munitions procurement will remain an item of interest across the FYDP.

Joint Direct Attack Munition and Small Diameter Bomb

The Joint Direct Attack Munition (JDAM) is the air-to-ground weapon of choice and is experiencing a 134% increase in expenditures so far in FY19 compared to FY18. In FY15, JDAM production capacity was 18,500 tailkits per year; by FY18 tailkit production increased to 45,000 tailkits per year to meet the needs of the Services and Foreign Military Sales (FMS) partners. The Air Force plans to procure 37,000 tailkits in FY20 with a request of \$1.07 billion, with Navy and FMS partners procuring the remaining production capacity.

Small Diameter Bomb I (SDB I) provides reduced collateral damage effects and increased load-out per sortie for our warfighters. Due to its high operational utility, the Air Force ramped the line from 3,000 weapons per year in FY15 to 8,000 weapons in FY17. The Air Force's FY20 budget requests \$275.4 million and plans to order 7,078 weapons and the remaining quantity is available to FMS partners.

SDB II will complete Initial Operational Test and Evaluation in FY19, and in conjunction with the Navy, the Air Force's FY20 budget requests \$212.4 million to procure 1,175 weapons, maximizing the production capacity. Though not yet fielded, the SDB II will soon provide a key air-to-ground capability to kill mobile and fixed targets through adverse weather from standoff ranges. All of these production increases expedite the inventory replenishment of our critical munitions and build stockpiles for future needs.

Finally, Hellfire missiles provide a time-sensitive, direct strike capability for our remotely-piloted aircraft and remain in high demand around the world. Production capacity, shared between Hellfire and Joint Air-to-Ground Missile (JAGM), was ramped up from 5,000 missiles per year in FY15 to 11,000 missiles per year in FY19. The FY20 budget requests \$299.6 million and procures at least 3,859 Hellfire missiles. With other Services and critical FMS partners, the production line will remain funded to maximum production capacity.

Joint Air-to-Surface Standoff Missile and Advanced Medium Range Air-to-Air Missile

As the Air Force responds to current operational demands, we are also looking to the future to ensure we are prepared to defend against more advanced threats as directed in the National Defense Strategy. Doing so requires advanced weapons capabilities, and the FY20 budget request reflects the Air Force's plan to continue investing in those areas, specifically with the Joint Air-to-Surface Standoff Missile (JASSM) and the Advanced Medium Range Air-to-Air Missile (AMRAAM). These weapons provide unique capabilities in an anti-access/area denial (A2/AD) environment.

JASSM is the premier air-to-ground, low observable missile for defeating threats in highly contested environments. The FY20 budget requests \$482.5 million to procure 430 missiles. The program is focused on meeting 2018 National Defense Strategy objectives for

increased inventory by implementing a strategy to ramp up production rates and monitor subsystems for obsolescence. To achieve this, we have partnered with industry to expand production capacity to satisfy a 47% increase in our inventory objective.

Production of AMRAAM missiles, a critical air dominance weapon, remains consistent with FY19 procurement levels by requesting \$332.3 million for 220 Missiles, as industry partners begin to cut-in a solution to obsolescence issues through the Form Fit Function Refresh (F3R) effort. Cut-in of F3R begins this year with initial deliveries starting in FY21, and production rate continues to ramp up through FY24.

Stand-In Attack Weapon and Extended Range Weapon

To defend the Nation in an increasingly competitive global environment, we must look beyond currently fielded weapons systems and invest in future advanced munitions capabilities. To that end, the Air Force continues to invest in the Stand-In Attack Weapon (SiAW) to deliver a strike capability to defeat rapidly relocatable targets that create the A2/AD environment. The FY20 Budget requests \$162.8 million, and \$841.4 million across the FYDP. Additionally, the Air Force is investing \$246.2 million in FY20, and \$587 million across the FYDP, in the Extended Range Weapon (ERWn), a rapid prototyping program to develop an advanced multi-role interceptor missile to defend against and defeat missile threats. Finally, the FY20 Budget request continues to invest in rapid prototyping programs to develop hypersonic weapons for long-range, prompt strike capabilities.

Intelligence, Surveillance, and Reconnaissance

Aligned with the National Defense Strategy, the Air Force is aiming to reorient the Intelligence, Surveillance, and Reconnaissance (ISR) Enterprise by aligning ends, ways, and means to address the peer threat environment through the increased use of human-machine

teaming. The end goal is a ready Next Generation ISR Enterprise possessing a decisive advantage for the warfighter while remaining competent across the entire spectrum of conflict.

To meet the challenges of a highly contested environment, the future ISR portfolio will consist of a multi-domain, multi-intelligence, collaborative sensing grid that utilizes advanced technology; it will be resilient, persistent, and penetrating to support both kinetic and non-kinetic capabilities alike. The FY20 budget submission takes the first steps towards repurposing, retooling, automating and stabilizing the force to ensure the ISR Enterprise can achieve this vision within the next decade. The Air Force aims to increase both the quality and quantity of ISR capabilities with fewer Airmen while remaining competent across the Range of Military Operations. The very innovation and technologies our Airmen have created in the field will allow our entire ISR Enterprise to advance and posture for operations in the digital age.

E-3 Airborne Warning and Control System

The current E-3 Airborne Warning and Control System (AWACS), with planned modifications, is viable until 2038. The FY19 PB restored O&M, procurement and MILPERS for one active duty E-3 AWACS operations squadron, five PMAI, one BAI, and one attrition reserve aircraft with manpower. In the FY20 PB, the Air Force continues to invest and enhance the E-3 AWACS in support of combatant command and joint requirements. The Air Force continues to modernize the E-3 fleet through several major upgrade efforts to ensure it can support 5th to 4th generation aircraft, meet Federal Aviation Administration and international mandates and sustain availability rates. The largest modernization efforts include Block 40/45 modification to upgrade the mission computer, Diminishing Manufacturing Sources Replacement of Avionics for Global Operations and Navigation (DRAGON), modification to upgrade avionics, meet safety-of-flight

mandates, mode five installation, Mobile User Objective System (MUOS), and other radio datalink upgrades.

E-8C Joint Surveillance Target Attack Radar System

The Air Force developed and implemented a funding strategy to increase the operational and maintenance availability of the legacy E-8C Joint Surveillance Target Attack Radar System (JSTARS) to ensure aircraft viability and maintain battle management command and control/ground moving target indicator radar coverage into the future. Current funding is applied to a key communication system project that will replace diminishing manufacturing source equipment with modern Common Data Link. The program is exploring further efforts to maintain system viability in future years, including installing the Mode five transponder, and ARC-210 radios. The aircraft availability standard is 68%. FY18 ended with E-8C aircraft availability at 40.2%. The System Program Office is executing multiple initiatives to address declining fleet aircraft availability rates, which should improve aircraft availability to 62.3% by FY23. These initiatives include implementing a base level Organic Depot and instituting commercial airline maintenance best practices, with a target of reducing standard depot maintenance timelines by 25% and increasing the intervals between Programmed Depot Maintenance from two years to six years.

Substantial risk remains as to whether or not the Air Force will be able to provide six deployed E-8C aircraft to the Combatant Commanders to meet the force presentation mandate from the FY19 NDAA, Section 147(f)(1). Risk increases significantly without resolution of engine shortages and procuring a test asset for modernization. We project that in FY21, we could deploy four to five aircraft. Deploying six aircraft is possible, but doing so would require a temporary halt of JSTARS aircrew initial qualification training, significant reduction in

continuation training or a halt in installation of mandated equipment upgrades. Our current estimate is that the earliest we could have six JSTARS aircraft forward deployed, without negatively impacting training or equipment upgrades, is by October 2022.

MQ-9

The Air Force's FY20 investment funding request of \$1.1 billion will continue MQ-9 fleet modernization efforts aimed at providing cutting edge capabilities to the Combatant Commands. To date the MQ-9 fleet has flown approximately two million hours, with 91% of those hours supporting combat operations. This extraordinary level of warfighter support is facilitated by a unique program architecture in which MQ-9 sustainment and modernization efforts are managed as separate, yet fully integrated and complementary programs of record. This allows the Air Force to focus on operating and sustaining fielded MQ-9s while robust development and testing of planned modernizations is conducted in parallel. This strategy keeps the MQ-9 relevant with regards to the needs of the Combatant Commands while at the same time addressing future and emerging requirements. By structuring this way, mature and proven upgrades for the program at large are delivered when and where they are needed.

MQ-9 modernization efforts include the new Block 50 Ground Control Station currently in development, a new DAS-4 sensor package, an extended range enhancement for Block 5 aircraft and an effective and reliable open systems architecture. Additionally, the MQ-9 program is actively engaged in mitigating the operational and maintenance impacts of sustaining a multi-configuration fleet as well as enabling airspace integration and access. The desired end state is a 100% Block 5 MQ-9 fleet operated exclusively by Block 50 Ground Control Stations in Mission Control Element operations, with Block 30 Ground Control Stations used solely for launch and recovery operations.

RC-135

The Air Force is committed to sustaining and upgrading the RC-135 fleet as it continues to be our most capable, relevant and viable signals intelligence platform. Continued modernization utilizing rapid acquisition and fielding processes is critical as we address emerging peer threats and the return to great power competition. The RC-135 is critical to our decision advantage as it provides vital intelligence data at unrivaled speeds to both the national-level intelligence community and the tactical-level warfighter.

The FY20 investment funding request of \$289.9M facilitates mission system improvements for the entire RC-135 variant fleet. Efforts include the automation of additional search and detection capabilities, improved near-real-time data distribution and collaborative processing, exploitation and dissemination supported by enhanced artificial intelligence algorithms. Finally, 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.

RQ-4

The RQ-4 Global Hawk unmanned aircraft system provides high altitude, long endurance, all weather, wide area reconnaissance and surveillance. The FY20 investment funding request of \$257.5 million, \$1.6 billion across the FYDP, furthers modernization efforts, to include MS-177 sensor integration, a ground segment modernization program and a communications system modernization program.

The MS-177 sensor is on track for Initial Operating Capability in the third quarter of FY19. The MS-177 will utilize the Block 30 ISR Payload Adapter, which has been fully tested and approved for future modifications. The Ground Segment Modernization Program is

progressing smoothly, with installation of upgraded cockpits at Grand Forks Air Force Base and Beale Air Force Base projected for completion in FY20. Finally, the program's efforts to modernize ground and air vehicle communications equipment is also moving forward. The Communications System Modernization Program will improve RQ-4 communications capability while alleviating diminishing manufacturing source (DMS) issues with current equipment.

U-2

The Air Force has programmed resources to retain the U-2 through FY24 to address combatant commander and intelligence community requirements. This effort promotes sensor interoperability and ensures modularity with other platforms where applicable.

WC-135

The mission availability of the current WC-135 fleet of two aircraft is well below acceptability and as such, we will replace the two WC-135s, investing \$210M to convert three KC-135R aircraft to three WC-135Rs.

Multi-Domain Command and Control

In future conflict, the prerequisite to achieving a strategic advantage over a peer competitor will be the ability to exercise multi-domain command and control. The Air Force approach to multi-domain control and control is focused on complicating our future adversaries' abilities to defend themselves. The Air Force is developing a Multi-domain Operations Center to fill a joint capability gap in command and control across regional and functional combatant commands. In FY20, the Air Force will experiment with enterprise data to address network challenges with a goal of eventually fielding a "Data Lake" to serve as a command and control platform across air, space, and cyber domains. We plan to have an initial capability by FY22 and then continuously expand the capability through rapid software acquisition.

Advanced Battle Management System

The Advanced Battle Management System (ABMS) will realize the vision of multi-domain command and control to propel our warfighting capability through a layered family of systems construct. We are striving for the capability where any sensor can talk to any shooter whether in space, on land, at sea, in the air, or in cyberspace. Our aim is to have intelligence and targeting data transformed into timely and actionable information through trusted networks and intelligent algorithms that enable our people to focus on decisions. In this construct, information is a service, rather than a platform, and the layers of sensing and the communication pathways will provide reliability and assurance in a contested environment.

We have started reviews to evaluate existing and emerging potential technologies and platforms across the Defense Department, the Intelligence Community, and the commercial world, to perform integrated analysis of the capability of various options to contribute to the fight and prioritize investment over time. We are beginning to develop requirements and standards for engineering discipline during execution, and all along the way to challenge ourselves and our Labs, commercial, and government partners to demonstrate capability early. As we pursue ABMS, we will maintain the right mix of legacy and future capabilities over time to be ready to fight. We are dedicated to pursuing ABMS thoughtfully. In total, from FY19-FY24, the Air Force is funding \$3.8 billion towards the pursuit of ABMS across supporting programs. The FY20 PB request includes \$525.5 million for investments across sensors, battle management command and control, communications, and architecture activities.

To date there have been no changes to the Joint Requirements Oversight Council requirements for the ABMS Initial Capabilities Document. The Initial Capabilities Document addresses JSTARS requirements for ground centric requirements, in addition to air centric

targets as well. ABMS will be able to perform the mission sets associated with both the JSTARS and AWACS platforms and possibly assume other roles of the Theater Air Control System. Additionally, Ground Moving Target Indicator (GMTI) requirements are being folded into the overarching ABMS architecture.

We are moving forward on ABMS, with the Analysis of Alternatives beginning in January 2019. It is being accomplished on a compressed schedule with release of results expected in the Fall 2019 timeframe. The on-going Analysis of Alternatives addresses our ability to conduct both the air moving target indicator (AMTI) mission and ground moving GMTI mission from permissive to highly contested environments in a disaggregated manner.

Recently we hired a Chief Architect, as a permanent Senior Executive Service equivalent position, and he officially began work this month. His first of many tasks will be to oversee the ABMS architecture design, enterprise communications and integration across programs. He will also identify technologies to enable horizontal and vertical integration across operating environments and warfighting domains.

Air Operations Center/Kessel Run

Air Operations Center (AOC) Weapon System interoperability with the multi-domain command and control (MDC2) vision remains essential to the AOC way ahead. The fielded AOC Weapon System Increment 10.1 legacy system will not support the MDC2 vision without significant improvements and modernization, and the Air Force is committed to fielding a modern architecture for the AOC that enables the goal of a common command and control platform. The FY20 PB request includes \$148 million to support sustainment and the additional AOC development capacity required to retire the AOC 10.1 infrastructure and software while

leveraging modern commercial software best practices. This year's budget request is required for the AOC to remain viable and will result in faster decision making capability, leading to more success in combat when fighting against a near-peer adversary.

Kessel Run

We are revolutionizing the way we build and deliver software. The Air Force's Software Factory, the Kessel Run organization, is proving we can get valuable software released faster, with higher quality and reduced risk using an agile software development operations (DevOps) approach. This approach focuses on obtaining immediate user feedback, allowing for rapid delivery of capability that matters most to the warfighters. Kessel Run's initial effort, the AOC Pathfinder, was successfully completed in July 2018 and transitioned to the AOC Weapon System Block 20 development effort using Section 804 authorities of the FY16 NDAA. The Air Force appreciates the use of these rapid prototyping and rapid fielding authorities, which have created a potential two-year schedule savings to retire the outdated legacy AOC 10.1 baseline.

We are leveraging the flexibility in these authorities to not only make development faster and delivering capabilities in weeks instead of years, but to also achieve better results for planning, executing, and assessing theater-wide air and space operations. To date, we have successfully deployed capabilities at Langley Air Force Base, Al Udeid Air Base and Osan Air Base to prove out agile DevOps at scale. Within these deployed capabilities, we have demonstrated the ability to increase the speed of initial software product delivery by as much as 83 percent, and the ability to successfully deliver software application updates to users within hours. The Kessel Run organization also offers Enterprise Services, has expanded beyond AOC's current 17 applications, and is developing a diverse portfolio of 12 additional applications including business enterprise systems and a logistics information system for the F-35.

Cyber Warfare

Military operations in 21st century demonstrate the imperative to integrate cyber capabilities into multi-domain operations, project power in cyberspace, and defend our networks from adversarial attack. Our FY20 cyber warfare budget proposal reflects this reality and supports the Defense Department's priority of cyber defense, resilience, and continued integration of cyber capabilities into the full spectrum of military operations.

Unified Platform

Cyber operations demand network-centric and data powered operations, and Unified Platform provides that capability. Future conflicts at and below the level of warfare require the synchronization of information to coordinate appropriate responses in defense of our nation and accomplishment of Combatant Command objectives. Unified Platform delivers a common digital backbone facilitating the movement of cyber warfare data and information flows by connecting disparate cyber weapon systems across the military Services and U.S. Cyber Command. The FY20 funding request of \$104.7 million, with \$594.2 million planned across the FYDP, reflect the Air Force's commitment to network-centric operations. Unified Platform, one of the first 804 Rapid Acquisition programs, was designated in August 2018 and is serving as a pioneer for Agile Software Development Acquisition constructs. Unified Platform will facilitate information sharing, communication, and provide the ability to extract the insights required to remain relevant in the dynamic cyber terrain. We need the ability to rapidly develop, field, and modify Unified Platform, and the LevelUP software development factory ensures our continued technological superiority. We have already demonstrated early successes in merging disparate data sources and enriching the information to advance our cyber operations. We are postured to

accelerate the deployment of Unified Platform across the Cyber Mission Force and Service cyber components.

Joint Cyber Command and Control

The Joint Cyber Command and Control program addresses a challenge prevalent in current cyber operations, which is the lack of cyber situational awareness of the cyber terrain and battle management of cyber forces at the strategic level. The FY20 funding request is \$29.5 million, with \$197.5 million planned across the FYDP. Tomorrow's military operations must be integrated across all Services and Combatant Commands, and Joint Cyber Command and Control addresses this need. Current software applications and future programmatic initiatives are codifying an architecture, requirements, and development processes that will inform and empower Joint Force Commanders, Combatant Commands, and Service Component Commanders to make informed, operational decisions at speeds necessary in the cyber domain. To fulfill this, four prototypes are currently being analyzed for immediate deployment and future selection as "best of breed" components in the full Joint Cyber Command and Control solution. Employing existing resources today enables faster delivery of a full capability resulting in a quicker turn for cyber situation awareness and battle management capability.

Offensive and Defensive Cyber Warfare Systems

The Air Force continues to invest in improving its offensive and defensive cyber weapon systems. Defensive Cyberspace Operations proactively defends the Air Force network and DoD network enclaves against unauthorized intrusion, corruption, and/or destruction. Our cyberspace operators continue to protect our networks day and night and our acquisitions community continues to deliver new capabilities to meet the ever-changing threats in cyberspace. Our FY20 request doubles our procurement of Mission Defense Teams toolkits, supported by the FY20

request of \$7.6 million, and \$62.0 million across the FYDP. We are accelerating the growth to ensure Air Force wings are equipped with the right systems to defend their networks and keep their operations running securely.

The Air Force is also ensuring our offensive cyber forces are best equipped to align with the National Defense Strategy goals of lethality and competition below the level of armed conflict. In our FY20 budget request, we added \$212 million in offensive cyber investments across the FYDP to ensure our Cyber Mission Teams are equipped with sufficient capabilities and capacity to conduct operations as required to meet the needs of our joint forces commanders. These funds align directly with the DoD Cyber Strategy and work in concert with the investments from the other Services and U.S. Cyber Command. Air Force cyber capabilities provide critical support that protect Americans and our Allies both on the battlefield and at home every day.

Cyber Resiliency

The Cyber Resiliency Office for Weapon Systems (CROWS) continues to actively advance weapon system mission assurance in an increasingly cyber contested environment. CROWS enables smart modernization across the fielded fleet by identifying critical cyber vulnerabilities of existing weapon systems, developing enterprise-level mitigation solutions in conjunction with acquisition Program Executive Offices (PEO); and developing, publishing, and institutionalizing best practice system engineering techniques to build cyber resilient modifications and new systems. The CROWS has partnered with PEO Fighter/Bomber, as well as the C-17 and Joint Mission Planning System Program Offices, to prototype cybersecurity initiatives affecting enterprise hardware and software applications, worked with the F-15 Program Office and Defense Digital Service to increase robustness of next-gen ground

support systems, provided cyber training to over 147,000 Airmen, and developed contractual and practical guidance for the acquisition community to ensure our Air Force modernization efforts keep pace of adversary cyber capabilities.

Common datalink modernization

The Tactical Data Network Enterprise Program Office has multiple developmental efforts with regard to FY18 NDAA Section 234, which focus on secure, low probability of detect data link networks with the requirement of operating within contested and highly contested environments. These efforts include enhancements to Link-16 networks to address the effects of adversary jamming, software programmable Open Mission System (OMS) compliant radios capable of hosting a variety of advanced non-proprietary waveforms while also allowing backward compatibility, and Agile Communications, an experimentation effort that supports open standards and advanced apertures across aerial networks. In addition, 5th to 4th generation gateway provides redundancy in data sharing between 5th and 4th generation platforms. Finally, the Common Data Link Executive Agent is working closely with the Services to improve existing Low Probability of Intercept/Low Probability of Detection/Anti-Jam capabilities within the Common Data Link family of waveforms, to provide enhanced ISR support in future anti-access/area-denial airspace.

Modular Open Systems Approach

Modular, open systems, based in common and consensus based standards, reduces acquisition and lifecycle costs, improves innovation and competition, simplifies technology refresh, improves interoperability, and enables cheaper and faster modernization. The Open Architecture Management Office, established in January 2019, is posturing to be an Air Force wide office of expertise for common standards and open architecture efforts. The Open

Architecture Management Office, located under the Air Force Life Cycle Management Center, currently manages the Open Mission System and Universal Command and Control Interface initiatives. These consensus based standards initiatives are being implemented on major weapon systems, such as the F-22 and B-52 Radar Modernization Program. There are also significant efforts to ensure these standards are compatible with other consensus standards such as the Future Airborne Capabilities Environment and Sensor Open System Architecture. The Air Force efforts in modular, open systems will enable rapid and reduced cost modernization.

Conclusion

We want to give credit and thanks to Congress. Without the Rapid Acquisition Authorities given to us by Congress, there would still be a half-century of unnecessary time in over 20 of our programs. The Section 804 authorities allow us to develop and field technologies faster and smarter. Additionally, we appreciate the delegation of Milestone Decision Authority to the Service Acquisition Executive; we have subsequently delegated all medium and small programs to the field, increasing overall decision-making capacity and speed. Because of Congressional action, we can focus on performance—rather than process—in our rapid capability development efforts.

We will continue to look for opportunities, all centered on speeding our process, to remain competitive for tomorrow's Airmen as we remain dominant for today's. There will be no silver medal for building the world's second-best Air Force. The steps we have taken with the authorities you have given us demonstrate we do not intend to.