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THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

STATEMENT OF

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F-35 LIGHTNING II PROGRAM

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

F-35 PROGRAM REVIEW

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I Introduction

Chairman Turner, Ranking Member Tsongas, and distinguished Members of the Subcommittee, thank you for the opportunity to discuss with you today how the President's FY 2019 Budget request supports the fact-of-life, program wholeness and near term critical investments necessary for our F-35 Lightning II Program. As adversaries across the globe continue to develop advance capabilities of their own, this conversation serves as an opportunity to align programmatic expectations and goals while discussing the operational accomplishments that are redefining the battlespace through the acquisition of the world's most advanced fifth-generation strike fighter. In January 2018, the Secretary of Defense outlined his agenda for "Sharpening the American Military's Competitive Edge" in the 2018 National Defense Strategy. As the subsequent discussion will demonstrate, the F-35 plays a central role in the three crucial pillars of this framework:

Building a More Lethal Joint Force

- The F-35 Air System is the premier multi-mission, fifth generation strike fighter that provides our warfighters unmatched, game-changing capabilities.
- The F-35's interoperability allows seamless information exchanges making every participant in the battlespace smarter, more lethal, and more survivable.

Strengthening Alliances and Attracting New Partnerships

- The unique F-35 Partnership brings together our three U.S. Services with our eight Partner nations and three Foreign Military Sales customers that strengthen our acquisition, government and warfighter alliances.
- The F-35 program modernizes the defense capabilities of participating nations and enables coalition-based fighting, international interoperability, enhanced global reach and a strong global industrial base coalition.

Reforming Business Practices for Greater Performance and Affordability

- The F-35 will be the world's most advanced fighter for the next fifty years, and to ensure the aircraft remains ahead of adversaries, the enterprise will continually deliver enhanced capability to the warfighter with a focus on affordability and speed.
- The F-35's number one priority is the continued aggressive reduction and avoidance of costs through new uses of agile development, streamlined production and global support sustainment practices, allowing us to work smarter and cost-effectively to make the air system more affordable for all Customers.

On this strategic foundation, the F-35 Joint Program Office enters a critical transition period as we prepare to deliver the full Block 3F warfighting capability, transform the Enterprise to embrace true agile acquisition processes for future modernization, ramp up to full rate production and continue to expand the global sustainment framework in support of our US Services and Partners' warfighters. With over 270 fielded aircraft operating from twelve (12) sites within the United States and abroad, F-35 warfighters are beginning to experience the true game changing capabilities the F-35 brings to bear as well as identifying challenges that need to be addressed. Through these efforts, along with the aggressive implementation of cost-saving initiatives, the F-35 will be more survivable, supportable, lethal, and affordable than ever before and will ensure our expectation for decades of continued U.S. air superiority is reaffirmed

While the Program's leadership has undergone change since last appearing before your subcommittee, its attention to these tenets remains constant. With a renewed focus on affordability, transparency, communications and stakeholder engagement, the Program's future, its three lines of effort (production, sustainment, and development), the United States, its International Partners, and the Program's FMS customers are well-prepared to meet the challenges and threats of the future.

II Program Successes and Accomplishments

We are pleased to report many accomplishments during the past year, both programmatically and operationally. The F-35 Joint Program Office made major strides in finishing Block 3 testing, completing all weapons test points and the majority of the remaining flight science and mission systems test points, a total of 5,266 developmental flight test points. The F-35 Enterprise made significant progress towards the completion of test readiness criteria required to begin formal Initial Operational Test and Evaluation (IOT&E), providing weapons and flight envelope clearances to allow for Pre-IOT&E activities. The Program delivered 66 aircraft to its customers, completing LRIP Lot 9 deliveries. Finally, the F-35 Sustainment Team managed the flight operations and maintenance of 270 F-35 aircraft at thirteen training and operational sites, and increasing the number of trained F-35 maintainers to over 5,000 personnel worldwide.

Operationally, eight United States Air Force F-35As from the 34th Fight Squadron at Hill Air Force Base in Utah deployed to Royal Air Force (RAF) Lakenheath in the United Kingdom in June. The 34th Fight Squadron flew seventy-six sorties and tallied more than 154 flying hours alongside F-15s from the 48th Fighter Wing based at RAF Lakenheath. The aircraft then forward deployed to Estonia and Bulgaria to maximize training opportunities and build partnerships with allied air forces. RAF Lakenheath is scheduled to receive its first permanent F-35A Lightning IIs in 2021.

In August, to demonstrate solidarity with our allies in northeast Asia, four F-35Bs from Marine Corps Air Station Iwakuni in Japan, two B-1Bs from Andersen Air Force Base in Guam, two Japan Air Self-Defense Force F-15Js, and four Republic of Korea Air Force (ROKAF) F-

15Ks flew together over the waters near Kyushu, Japan, and the U.S. and ROKAF aircraft continued on and flew across the Korean Peninsula.

In October, the U.S. Marine Corps participated in Exercise Dawn Blitz where U.S. Marine Corps F-35B Lightning II, assigned to Marine Fighter Attack Squadron 211 conducted operations aboard the USS ESSEX (LHD-2) to test the ability to conduct amphibious operations and completing thirteen (13) carrier qualifications.

As the Program continues toward the U.S. Navy's Initial Operating Capability milestone later in 2018, the F-35 Enterprise is razor focused on seeing that everything is in place to support the Navy. Last year, Naval Air Station Lemoore in California stood up as the Navy's F-35 Fleet Replacement Squadron and its Strike Fighter Squadron (VFA-125) conducted day and nighttime flight operations aboard the USS CARL VINSON (CVN 70). Also last year, the Navy conducted F-35 pilot carrier qualifications aboard the USS ABRAHAM LINCOLN (CVN 72).

Our International Partners and FMS customers recently achieved several noteworthy milestones as well. Of exceptional note, in November the Royal Norwegian Air Force became the second International Partner to receive an F-35 on its home soil. The Royal Norwegian Air Force acknowledged this accomplishment during its 73rd birthday celebration.

The F-35 Program continues to execute across the entire acquisition spectrum, including development and design, flight test, production, fielding and base stand-up, sustainment of fielded aircraft, and the building of a global sustainment enterprise and is in a full sprint across all three lines of effort.

III Development

While each line of effort is vital to the long-term success of our warfighter, our work to

deliver the F-35 weapon system begins with Development. By transforming the way we view the Program through an "eight element" model while delivering Block 3F capability, and preparing to meet DCA requirements, the F-35 continues to establish itself as a vital part of our nation's defense. To that end, the Program is preparing for Initial Operational Test and Evaluation (IOT&E) start and embracing an agile framework for the Continuous Capability Development and Delivery of Block 4 capabilities.

F-35 Eight Element Model: In order to demonstrate the F-35's capabilities on and off the battlefield, the Joint Program Office has transformed the way it conceptualizes the F-35 weapon system. This renewed approach serves as a reminder that the F-35 platform is more than just an aircraft. While the air vehicle's capabilities are transformed through the information provided by its operational flight program, similar relationships exist between JSF Reprogramming Labs and Mission Data Files, Autonomic Logistics Information System (ALIS) and Off-Board Mission Support, and Full Mission Simulators and their Threat Database; by establishing this eight element framework, the Program has better technical and programmatic control on how each component of the F-35 system arms the aircraft with revolutionary capabilities, lethality, and supportability that differentiate it from legacy platforms.

Block 3F: The F-35 is prepared to enter combat if required. The delivery of Block 3F improves warfighting capability with enhanced sensors and targeting, improved data links, improved threat countermeasures, and enhanced weapons capability to include air-to-air missiles, air-to-ground munitions, and weapons employment throughout the full aircraft flight envelope. Initial Block 3F software was delivered with later LRIP Lot 9 F-35A aircraft starting in August 2017 and included Block 3F Mission Systems capabilities required to conduct all critical mission

threads including: Strategic Attack, Close Air Support, Suppression/Destruction of Enemy Air Defenses, and Air Superiority.

Block 3F capabilities are in the fleet today and will continue to be delivered with LRIP Lot 10 F-35 aircraft. Since the initial Fleet Release of Block 3F software in August 2017 the F-35 JPO, in close coordination with U.S. Services and International Partners, has addressed critical Deficiency Reports (DRs) in order to deliver mission systems improvements and maximize F-35 mission effectiveness for LRIP Lot 10 Block 3F aircraft. The latest Block 3F software has demonstrated the capability maturity and stability to complete all required Missions Systems test points and address critical DRs as directed by the Services via the F-35 Configuration Steering Board. In addition, the Program is taking the necessary Airworthiness and Weapons Certification steps to enable full combat capability with Block 3F hardware, software, and weapons carriage with LRIP Lot 10 F-35 aircraft delivered during 2018.

The Program continues to deliver Block 3F capability for the F-35A and is on track to deliver Block 3F capabilities to the F-35B and F-35C later this year in May (BF-63) and July (CF-34), respectively. This capability delivery will support fleet operational needs, deployments, and entry into formal Initial Operational Test and Evaluation (IOT&E) in fall 2018.

Dual Capable Aircraft (DCA): While full warfighting capability was achieved with the delivery of Block 3F, the F-35 weapons system's nuclear capabilities are critical to building a more lethal joint force. As the Program transitions from SDD to the C2D2 framework for the delivery of Block 4, infrastructure will be required to support the development, integration, testing and fielding of approved Block 4 capabilities. The Program will leverage a minimum essential infrastructure for the development, integration, certification and testing of the DCA

capability. The F-35 Program's minimum essential infrastructure is a foundational capability that consists of the resources required to maintain development and integration labs, required test sites and facilities, Developmental Test (DT) aircraft, and industry and government manpower to support and maintain the labs and DT aircraft fleet. The United States is committed to upgrading DCA and is incorporating nuclear capability onto the forward-deployable F-35 as a replacement for the current aging DCA.

In accordance with the 2018 National Defense Strategy, nuclear capabilities are essential to our nation's long-term defense. F-35 DCA remains aligned with the initial increment of the Block 4 effort. Detailed Risk Reduction activities have been completed, ensuring the F-35A is fully compatible with the B61-12 weapon and initial planning for Block 4 Nuclear Certification efforts have begun in anticipation of initial B61-12 integration on the F-35A this year. The F-35 JPO remains fully engaged with the USAF, Department of Energy, and strategic partners, and is confident that this capability will be fielded and certified in time to meet specified need dates

Initial Operational Test and Evaluation: With warfighting capability delivered, it is essential to prove the effectiveness of the F-35 through thorough test and evaluation. There are forty-seven Initial Operational Test and Evaluation (IOT&E) test readiness criteria that must be met before formally beginning IOT&E. Examples of readiness criteria include: aircraft and weapons envelope certification, verified and validated Block 3F mission data file production, and the number of aircraft in a Block 3F configuration. Formal IOT&E is currently expected to begin during the late third quarter of 2018. To help mitigate delays in Program development, the Director of Operational Test and Evaluation (DOT&E), in coordination with the operational test agencies, agreed to permit the execution of select "Pre-IOT&E" activities prior to satisfying all

forty-seven readiness criteria. Pre-IOT&E activities are occurring in two increments in early 2018.

In January and February of this year, six F-35s (two of each variant) deployed to Eielson Air Force Base in Alaska for the first increment of Pre-IOT&E activities. The six F-35s conducted cold weather testing in sub-zero degree (Fahrenheit) temperatures and assessed the F-35 air vehicle system's effectiveness, suitability, and mission capability during alert launches. Pre-IOT&E Increment Two is expected to begin mid-2018 and will evaluate the F-35 in tactical missions such as Close Air Support (CAS), Strike Coordination and Reconnaissance (SCAR), Aerial Reconnaissance (Recce), and Forward Air Controller (Airborne) (FAC-A). These tests will include weapons delivery effectiveness evaluations. They will also include assessments of F-35B and F-35C variants in shipboard operations. Formal IOT&E includes Defensive Counter-Air missions and combined mission scenarios executed by two 4-ships of F-35s to achieve realistic complexity, threat densities, and schedule-range-cost efficiencies.

Continuous Capability Development and Delivery - Block 4: With recent progress and goals in mind, the development of F-35 warfighting capability does not end with the delivery of Block 3F software. Rather, it is the foundation upon which continuous enhancements and improvements will be made to increase capabilities that make the F-35 more lethal and survivable. To ensure the F-35 remains a relevant, capable warfighting platform, the Block 4 capability set was approved by the U.S. Services and Partner nations, and formally endorsed by the Joint Requirements Oversight Committee during spring 2017. With Block 4 requirements defined, the JPO determined that legacy linear development and delivery approaches could not deliver the required capability on the necessary timeline at available funding levels.

The F-35 program is taking a new approach to deliver post-SDD capabilities in order to provide the warfighters F-35 weapon system modernizations, enhancements, and improvements faster and more frequently. Under this new capability delivery paradigm, software sustainment and modernization will no longer be two separate efforts. C2D2 is a strategy that allows support and enhancements to fielded capabilities while also delivering advanced capabilities. This effort reflects a shift to a more agile process that enables the F-35 enterprise to incrementally develop, integrate, test, and deliver the Block 4 capability set on an operationally-relevant timeline.

Objectives of C2D2 include a six-month enhancement and improvement software delivery cycle and a twelve-month interval for modernization. The approach includes a sequence of two capability drops aligned with a cycle of Technology Insertions. Technology Insertions leverage rapid commercial off-the-shelf computer upgrades to keep pace with technology and minimize obsolescence while solving diminishing manufacturing source issues. Maintaining hardware currency provides the flexibility to quickly develop and implement changes to meet the evolving threat. On a longer range cycle, as industry moves to a next generation of computing architecture, F-35 C2D2 will plan a Technology Refresh (TR) to capture the next higher level of computing capacity. While such a change is involved and complex, these upgrades are essential to the viability of the F-35 throughout its full lifecycle. Based on experience from the F-22, an eight-to-ten year span between Technology Refresh events will maintain viable warfighting capability throughout each cycle. TR-3 is planned for implementation as soon as possible, but not later than LRIP Lot 15, with an objective of accelerating into LRIP Lot 14. The Technology Refresh, Technology Insertion, and C2D2 Capability Drop Agile Acquisition Cycles are represented in Figure 1 below.

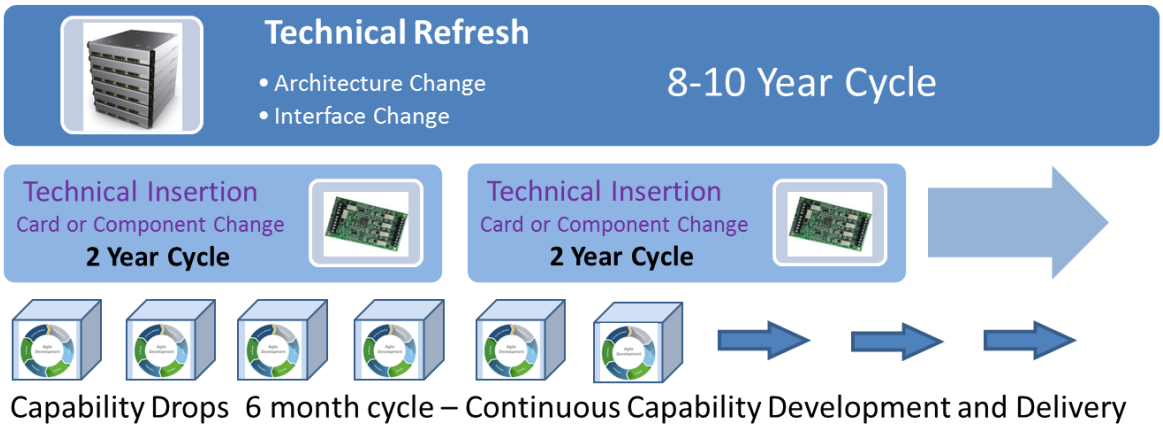

Figure 1 C2D2 Agile Acquisition Cycles

The program is developing a strategy for System Engineering Transformation (SET) that will leverage Model Based Systems Engineering (MBSE) to rapidly develop and deliver F-35 capabilities and is establishing a Government/Industry team to develop the strategy for this initiative. The team will assess previous modeling & simulation efforts on F-35 and other programs to identify lessons learned; evaluate and map current F-35 Systems Engineering processes and tools to MBSE approaches and tools; identify investment for tools, training, and other infrastructure requirements; and create an implementation plan.

In December the Program completed Requirements Decomposition and a System Functional Review. Additionally, the TR-3 hardware strategy (including new F-35 main computers and displays) was implemented, a suitable specification was developed, and the TR-3 system design phase contract was awarded to Lockheed Martin in the first half of 2017. The coming year will be filled with many new development challenges and achievements as well. 2018 will include further Requirements Decomposition and Preliminary Design of select Block 4 capabilities as well as completion of the Preliminary Design Review this fall. A Planning and

Systems Engineering Phase II contract award is planned for spring 2018, which will support a Preliminary Design Review for select Block 4 capabilities and a System Requirements Review for Block 4 capabilities that will be developed later in the Program.

IV Production

Aircraft production continues to accelerate while aggressively driving costs out of the production line. Efforts such as Blueprint for Affordability and War on Cost initiatives, economic order quantity (EOQ) purchases, and Government-direct purchasing continue to ensure the F-35 is not only lethal, survivable, and supportable, but affordable as well. With suppliers in forty-five states and eleven countries (Figure 2), these are truly global production efforts. Together, with each of our Partners and FMS Customers, the F-35 Program continues to realize progress and achieve results in terms of delivery performance, pricing, and contracting.

Figure 2: F-35 International Global Supply Base

Delivery Performance: In order to meet increasing schedule demands, the Program will continue to ramp up production while focused on improving quality to support cost and delivery targets. During 2017, seventy-four propulsion systems and sixty-six aircraft were delivered as planned. Over 280 aircraft have been delivered to date and all LRIP Lot 9 deliveries are now

complete.

In 2017, the Program delivered sixty-six aircraft and achieved the planned delivery goal for the year. This total includes nine LRIP Lot 8 aircraft that were delayed due to non-conforming insulation on polyalphaolefin (PAO) cooling tubes found in some F-35A wing fuel tanks in August 2016. Aircraft delivered in 2017 include sixty-one from the Fort Worth, Texas Final Assembly and Check-Out (FACO) facility, three aircraft from the Italian FACO in Cameri, Italy and two aircraft from the Japanese FACO in Nagoya, Japan. The Italian FACO produced their first "B" model and the two "A" model aircraft assembled at the facility in Nagoya, Japan were the first produced at that location. Of the sixty-six aircraft produced, thirty-four were delivered on time in accordance with the contracted delivery schedule.

Goals for 2018 include the delivery of ninety-one aircraft. Of those ninety-one aircraft, eighty-five aircraft will be delivered from the Fort Worth FACO, two aircraft from the Italian FACO and four aircraft deliveries from the Japanese FACO.

F-35 LRIP Pricing: The price of F-35 aircraft continues to decline. For example, the price (including airframe, engine, and contractor fee) of a LRIP Lot 10 F-35A aircraft ($94.3 million) is approximately 7.5 percent less than a LRIP Lot 9 aircraft. LRIP Lot 10 F-35B ($122.4 million) and F-35C ($121.2 million) aircraft are approximately 6.2 percent less than LRIP Lot 9 aircraft. The price of the F-35A fell below $100 million for the first time in LRIP Lot 10 and prices are expected to continue to decline as we negotiate LRIP Lot 11.

Over the course of the LRIP contracts, timeliness of aircraft deliveries has historically been a challenge. However, over the past few years, while production quantities have increased, the

Program has seen improvement in the timeliness of aircraft deliveries (Figure 3). Though getting better, the program is not satisfied with any delays.

LRIP	Average Days Late to Contract Deliveries
1	23
2	96
3	131
4	139
5	87
6	68
7	20
8	30
9	18

Figure 3: F-35 LRIP Aircraft Delivery Timeliness

Challenges/Quality Escapes/Scrap Rework and Repair: The F-35 weapon system has taken production of stealth fighter aircraft at high volume with an integrated support and training infrastructure to levels never seen before. Technologies required to create its unique characteristics continue to push the boundaries of manufacturing capability. As with all aircraft production, non-conformance to requirements and standards still occurs. These non-conformances or "defects" are identified and corrected before the government accepts an aircraft. Remediation of defects falls into three categories: Scrap (replace the part completely); Rework (correct the part); and Repair (render a full life part by authorized fix). Defect quantity and Scrap, Rework, and Repair (SRR) hours are measured throughout the production process.

Defects have been reduced by 45 percent since tracking began in LRIP Lot 6. Further, aircraft SRR hours per aircraft have been reduced by 78 percent since production began. While these achievements have aided in the production of superior products at reduced cost, the Program is not satisfied. The Joint Program Office, in partnership with the Defense Contract Management Agency (DCMA), continually strives to improve defect and SRR measures while

seeking out new measures through aggressive quality management. Such efforts include the identification and elimination of the root causes of defects, preventing future occurrences. Additionally, process controls and other proven practices are used to reach desired levels of defect prevention.

The efforts to prevent defects take place throughout the entire supply chain and across the weapon system. Ongoing corrective actions and initiatives improve producibility and foster the steady maturation and expansion of the F-35's global production footprint as quantities increase. Production quality metrics of SRR, Defect Reduction, and Out-Going Product Quality Level continue to improve lot over lot; however, they still represent medium risk to full-rate production objectives.

Due to recent quality escapes impacting production and field sites, JPO has chartered a Quality Review team that draws on senior quality experts within the Department of Defense (DoD) to evaluate enterprise Quality practices and improve Quality Management System processes. Program managers continue to work with contractors to implement aggressive program goals to meet affordability objectives by driving cost out of the program, increasing quality, and increasing availability to the warfighter.

Air Vehicle Production Contracting: While the U.S. Services continue to contract annually for LRIP Lots 12, 13, and 14, some F-35 Partners and FMS customers have initiated a Block Buy contracting strategy for LRIP Lots 12, 13 and 14. This strategy gives F-35 Partners and FMS customers flexibility to purchase all aircraft in a single procurement for LRIP Lot 12 (FY 2018) or to procure aircraft and engines in a multiple lot format for LRIP Lot 12 (FY 2018), LRIP Lot 13 (FY 2019), and LRIP Lot 14 (FY 2020). The U.S. Services will procure LRIP Lots 12, 13,

and 14 as single-year procurements and have requested congressional approval to award a single contract to procure two year advanced material and equipment for FY 2019 and FY 2020. There is no multi-year commitment for U.S. Services' aircraft and engines, which will continue to be bought on an annual basis for LRIP Lots 12 through 14 (FY 2018 - 2020) and preserves congressional annual discretion.

The risk of the Partners' and FMS customers' Block Buy for Lots 12, 13, and 14 is considered low because the design of the weapon system will be stable during this period of time. All F-35 variants have completed second life (8,000 hours full life) durability testing. Additionally, 99.9 percent of all hardware and subsystems qualifications are completed, and Block 3F capability will begin delivery this year, well before Lots 12, 13, and 14 are delivered. For the U.S. Services and Congress, the risk is even lower since the commitment is limited to the purchase of two years' worth of parts in a single EOQ procurement (FY 2019 and FY 2020).

Engine Production: In 2016, the Program completed contractual actions with Pratt & Whitney on LRIP Lot 9 and 10 for the F135 propulsion system. The F-35A/F-35C propulsion system reduced 3.4 percent from the previously negotiated LRIP Lot 8 price to the negotiated LRIP Lot 10 price. The F-35B propulsion system (including lift systems) reduced 6.4 percent from the previously negotiated LRIP Lot 8 price to the LRIP Lot 10 price. Pratt & Whitney has completed delivery of the sixty-seven production propulsion systems for LRIP Lot 9 delivering 33 percent ahead of contract delivery requirements. Pratt & Whitney has delivered approximately 50 percent of the 104 production propulsion systems for LRIP Lot 10 achieving a 71 percent delivery of the fifty-one production propulsion systems ahead of contract delivery requirements. Pratt & Whitney continues efforts to improve quality surveillance within its

manufacturing processes resulting in a 29 percent reduction in quality escapes during 2017; however, improvements at the vendor level are needed to identify and eliminate quality non-conformances which have interrupted engine deliveries. For 2018, Pratt & Whitney remains focused on increasing capacity at existing suppliers and qualifying second and third sources as needed to meet production ramp requirements.

V Sustainment

While development and production efforts of the F-35 Program are central to the creation of the aircraft, they must be matched with equally robust capacity for aircraft sustainment. The past year brought measured enhancements in both sustainment capability and affordability. The F-35's Global Enterprise is in a full sprint to execute and grow sustainment to provide cost-effective, safe, and timely Maintenance, Repair, Overhaul, and Upgrade (MRO&U) capability within a three-region framework (Europe, Pacific, and North America) for airframe, engine, component, warehousing, and distribution. There are over 270 aircraft fielded throughout the F-35 Enterprise; during the next five years, more than 670 aircraft are expected to be delivered and fielded. The global sustainability of this growing fleet relies on a common pool of spares and support equipment, common pilot and maintainer training, and common engineering support.

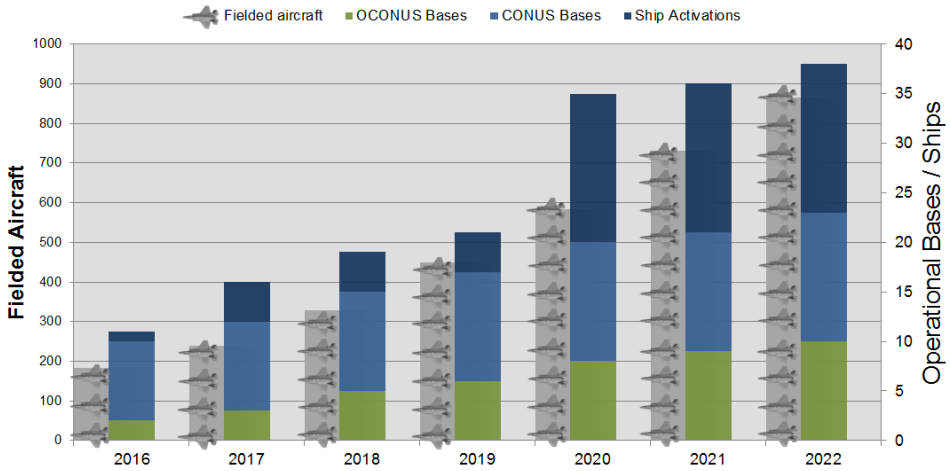

Figure 4: F-35 Fleet Growth through 2022

With over 5,000 maintainers worldwide, the F-35's sustainment capacity is growing immensely. In 2017, the JPO invested $3.4 million in Reliability and Maintainability (R&M) improvement projects and executed $1.4 billion to increase spare part purchases, build up repair capacity, and improve the speed of repairs. A five-year ALIS technical roadmap was developed to ensure cyber security, maintain current technology, and minimize Lifecycle Cost. Finally, to ensure Warfighter performance capabilities will be delivered within an affordable Operation and Sustainment (O&S) cost, the JPO established a 30 percent cost reduction mandate for life-cycle O&S costs over ten years based on the 2012 Sustainment Annual Cost Estimate (ACE) baseline.

There are over 270 F-35s operating at thirteen sites, five of which are overseas. Luke Air Force Base in Arizona is the main training base for the A Variant for the USAF, many Partners, and our FMS customers. Marine Corps Air Station (MCAS) Beaufort in South Carolina is the main F-35B training base for the USMC and United Kingdom. Additionally, Italy will utilize MCAS Beaufort from 2019 as additional F-35Bs are delivered from the Italian FACO. Eglin Air Force Base in Florida is the main training base for the USN's F-35C and Naval Air Station (NAS) Lemoore in California became the first USN operational unit with nine aircraft in VFA-

125 in January 2017. All F-35 maintainers also get their initial maintenance training at Eglin Air Force Base. In the next 4 years, we will add another 17 operating bases to the F 35 enterprise across all 3 regions of North America, the Pacific, and Europe. Cumulative aircraft availability rates remained steady from 2016 to 2017 at 51 percent: 53 percent for the A-model, 47 percent for the B-model, and 48 percent for the C-model which experienced higher rates of non-possessed time for depot modifications.

This continues to be a focus area for the Program and various Program initiatives are being executed to improve overall weapon system availability. A disciplined Reliability and Maintainability (R&M) Program, improved maintenance procedures and manuals, continued improvement in the ALIS, better forecasting of spares requirements, more agile spares contracting, improved repair turnaround times from suppliers and incorporation of aircraft design improvements are having a positive effect, but at a slower rate than desired. However, newer aircraft in later LRIP Lots are showing significantly better R&M Availability Rates when compared to older lot aircraft as design improvements are incorporated. Figure 5 shows combined (F-35 A, B, and C-model) Air Vehicle Availability (AVA) rates for each production lot.

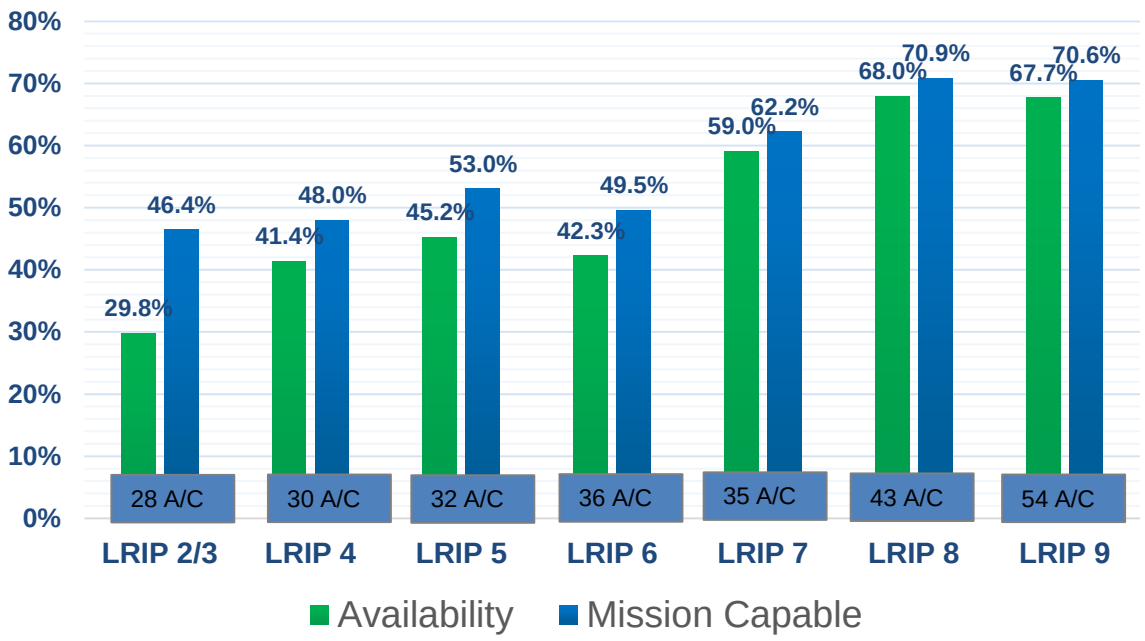

Figure 5: Aircraft Availability Rates by Production Lot

The Program continues to mature the Global Sustainment posture across Europe, Asia-Pacific, and North America. In December 2016, DoD made OCONUS regional MRO&U source of repair selections for sixty-five of the 456 components released for OCONUS repair. These initial component repair capabilities, when combined with F-35 airframe and engine heavy-level maintenance, begin establishing the foundation to provide all customers, including the U.S. Services, the capability to sustain their aircraft globally. This year, the F-35 JPO will make OCONUS source of repair recommendations to OUSD(A&S) for the next batch of 391 released air vehicle and propulsion components.

In August 2017, the DoD assigned regional warehousing capabilities for both Europe and Asia-Pacific Regions. Following analysis of support equipment maintenance requirements, it was determined there was no current business case for an OCONUS regional MRO&U capability, thus the Program is building an integrated network of Product Support Providers

consisting of commercial and organic sources of repair and calibration in all F-35 user countries on or near the operating sites. DoD has assigned to the F-35 Partners and FMS customers regional MRO&U including technology groups spanning wheels and brakes, electrical and hydraulic systems, power and thermal management, Lockheed Martin (LM-STAR) tested components, as well as warehousing for the global supply chain. These same capabilities either currently exist or are being stood up at U.S. Service depots in accordance with U.S. law.

Hybrid Product Support Integrator: The past year marked many milestones for the Program's HPSI, a partnership of government and industry organizations, which manages product support and other sustainment efforts. The HPSI declared initial operational capability (IOC) in 2016 and through effective collaboration, now works to ensure enterprise success across delivery streams including maintenance, supply chain, sustainment engineering, training, and logistics information systems. Within the HPSI, product support providers work to identify "best value" sustainment solutions and adhere to transparent decision making and source selection processes.

In May 2017, the HPSI continued to mature as the HPSI Operations Center transitioned to a new facility located in Fort Worth, Texas. The Operations Center is maturing in capability with personnel from all five major contractor teams manning the facility and contributing to availability improvements.

This year is shaping up to be equally promising for the HPSI. The organization will soon make a strategic basing decision and will begin executing its full operational capability (FOC) plan. Further, the HPSI will select OCONUS HPSI regional support sites and identify a Deputy HPSI Manager from among the Partners. By 2019, the HPSI will include approximately 440 individuals including Services, Partners, and Industry personnel.

Global Support Solution: As a truly global Partnership, the F-35 enterprise requires an effective Global Support Solution (GSS). Established upon core principles of transparency, continuous competition, and best-value analysis, the Product Support Manager, HPSI Manager, and Product Support Managers seek to offer effective sustaining engineering, training, and maintenance as the F-35 Program continues to embrace "contracting for outcomes" rather than simply "contracting for things."

With an emphasis upon fleet performance and increased readiness, affordability, and sustainability, the F-35 Program continues to implement and improve its Global Spares Pool, allowing the U.S. Services, International Partners, and FMS customers the opportunity to increase parts availability while leveraging economies of scale. The JPO is aware of and addressing each of the findings in last year's Government Accountability Office report and is confident that the appropriate steps are being taken to maximize aircraft availability for the warfighter.

The F-35 Lightning II Program will continue its organizational transition in a manner that achieves Program goals and complies with the JSF Production, Sustainment, and Follow-On Development (PSFD) Memorandum of Understanding (MOU). All participants continue to support the Product Support Manager (PSM) in fulfillment of the statutory mandate and in implementing the sustainment strategy through the GSS organization, which is tailored to meet participant and FMS customer requirements. The HPSI organization has achieved IOC (2016) and FOC (2019) maturity planning is underway and working daily sustainment of the F-35 fleet. The first service-led HPSI manager is on board and fully engaged in the transition. Delegation

of duties will increase during the transition period as the HPSI organization matures and business systems evolve.

All participants continue to work toward the maturation of an HPSI organization that integrates Government and industry capabilities and skillsets to achieve Program objectives and warfighter requirements as the Air System matures and expands, in accordance with GSS design criteria. Further, the participants will support the evolution of Product Support Provider analysis and execution.

In FY 2018, U.S., Partner, and FMS Customers will co-exist at various stages of operating capability with growing fleets as the Program continues to develop and negotiate value-based, long-term Logistics and Sustainment arrangements with Industry and organic providers. Deploying Global Support Solutions to leverage all stakeholder capabilities, human capital and best practices remains a priority. Finally, life cycle integration with an emphasis toward cost reduction, affordability, and R&M improvements to support the warfighter continue to drive F-35 sustainment efforts.

As the F-35 Air Vehicle matures, there is an increasing need to move maintenance tasks planeside to provide field units with maintenance capability to execute repairs at the Organizational Level (O-Level). For FY 2017, the Maintenance (Mx) Value Stream Team (VST), in conjunction with Lockheed Martin, initiated thirty-four Mx Plan "changes" costing $48 million, with a positive impact to Air Vehicle Availability (AVA) of 10 percent and $400 million in cost avoidance over the Program life-cycle.

The Mx VST Level of Repair Analysis (LORA) went beyond just economic-LORA, by conducting preliminary Maintenance Task Analysis (MTA) on Tire & Wheel initiatives.

Analysis showed that a cost avoidance of $491 million over a 20-year period could be realized by using a Condition Based Maintenance (CBM) concept for the wheel. The LORA team conducted MTA on twenty-nine specific components to support Department of the Navy (DoN) Intermediate Level (I-Level) effort with projected cost avoidance of $450 million over a 20-year life-cycle. The DoN programmed $42 million in FY 2019 funds to initiate this capability.

Further, Air Force A4 Headquarters requested an individual synopsis of Air Force I-Level maintenance using a Centralized Intermediate Repair Facility (CIRF), separate from the Regional Repair Network (RRN) approach recommended by the JPO. The analysis showed a return on investment (ROI) of $881 million using the full bed-down of 1,311 aircraft. Modeling excursions showed ROIs with reliability improvement of 10-20 percent above predicted; with the extreme of 50 percent aircraft with a 20 percent increase in reliability still showed a $296 million return on investment.

RRN models (Navy and Air Force combined) were updated, with the current RRN concept showing the largest impact for the F-35 Program with $1.8 billion in cost avoidance.

For FY 2018, eleven more Maintenance Plan changes are scheduled for completion during FY 2018, including an F-35 Wheel Overhaul Demonstration of Capability with I-Level maintainers at Beaufort MCAS using F-18 technical data (with projected cost avoidance of $491 million over a 20-year period). The Mx VST LORA will continue depot throughput analysis to build models to aid in analyzing depot throughput bottlenecks, material lay-in, resource requirements, cost, capacity, and other elements to improve turnaround times, while optimizing resources and reducing cost.

In FY 2018, the United States, International Partners, and FMS customers continue to increase in fleet size and capability. As we develop and negotiate value-based, long-term arrangements with industry and leverage all stakeholder capabilities, and as we drive Lifecycle Integration with an emphasis upon cost reduction and affordability, it is clear that the F-35 will be the sustainable and affordable weapon system necessary to face both today's threats and those of the future.

VI International Partners and FMS Customers

With eight International Partners and three FMS customers, international participation within the Program remains strong. Over the past year, aircraft deliveries continued to our United Kingdom, Italy, and Norway International Partners and to our FMS customers, Israel and Japan. Of note, Italy received its first F-35B aircraft in December which was assembled at the Italian Final Assembly and Check-Out (FACO) facility in Cameri, Italy. In January 2018, this aircraft completed a transatlantic flight and arrived at NAS Patuxent River in Maryland. The first Japanese aircraft from the Japanese FACO in Nagoya, Japan was completed in October and in February, Japan held a First Aircraft Arrival celebration at their Main Operating Base in Misawa, Japan.

Pooled F-35A pilot and maintainer training continues at Luke Air Force Base in Arizona for Italy, Norway, Australia, and Japan. Maintainer training for both F-35As and F-35Bs continues at Eglin Air Force Base in Florida. Pooled F-35B pilot and maintainer training between the United States Marine Corps and the British Royal Air Force continues at Marine Corps Air Station Beaufort in South Carolina. Italy is in initial discussions with the USMC for pooled F-35B training at Beaufort, South Carolina which is expected to start in 2019.

On 12 December 2017, the Government of Canada launched a Future Fighter competition to replace their CF18 aircraft with eighty-eight advanced fighter aircraft. The JPO has worked closely with the U.S. Defense Security Cooperation Agency to promptly and thoroughly answer all questions provided by the Canadian government in support of its fighter replacement analysis.

In February 2017, Turkey held a 95 percent Design Review for its first Major Operating Base in Malatya, Turkey. This review is a major milestone on the way to ensuring Turkey's infrastructure is ready for aircraft arrival in 2019. In August 2017, DoD assigned F-35 regional warehousing capability in the European and Pacific regions to the Netherlands and Australia, respectively. These overseas warehouse and distribution centers will enable the F-35 Program to optimize and manage aviation inventory inside the Global Support Solution construct.

In November 2017, the first three Norwegian aircraft arrived in-country at Ørland, Norway's F-35 Main Operating Base. Norway continues testing of the Drag Chute System (DCS) and is also working on the pre-integration of their Joint Strike Missile (JSM). The Dutch also intend to use the DCS, while the Australian government is considering JSM for their Air Force's maritime strike requirements. In December, the Israeli Air Force became the first F-35 OCONUS user to declare Initial Operating Capability (IOC). In August, the Israeli Ministry of Defense signed an amendment to their Letter of Offer and Acceptance (LOA) bringing the Israeli Air Force (IAF) projected total to fifty F-35A aircraft by 2024.

The JPO continues to work with potential FMS customers including Belgium, Finland, Germany, Switzerland, Greece, Romania and Spain, responding to all requests for information and other official inquiries. These and many other new and promising developments continue to foster opportunities and optimism among the U.S. Services, International Partners, and each

FMS customer. 2018 promises to be another year of progress across the global F-35 enterprise.

VII Conclusion

The F-35 Program is on track to have an energy-filled 2018. Operationally, F-35s will continue to support our Combatant Commanders with land-based and afloat units. The warfighters will continue to accept the F-35 weapon system and take delivery of aircraft while establishing new bed down sites.

Our Program will complete Block 3F capability delivery and the Operational Testers will measure its suitability and effectiveness for the warfighters. The Program is pivoting to an Agile development approach, which the Department will leverage to deliver Block 4 capabilities that will keep the F-35 viable against emerging threats in the years ahead. As the production line climbs its aggressive ramp to almost 100 aircraft per year, we are aggressively driving cost out of the production line and global supply chain. In Sustainment, the Program is driving cost-effective performance through affordability initiatives while it builds and reinforces a global supply chain and distribution network to hit Service and Partner cost and performance targets.

With this aggressive focus upon cost-reduction and with keen attention to production, sustainment, and development, the F-35 Joint Program Office remains proud of the Program's consistent progress and optimistic for its success. Alongside each of our International Partners and FMS Customers, the Program remains resolved to meet threats wherever they may arise, and is committed to provide fifth-generation air-superiority to the warfighter for many years to come. The JPO is working daily to ensure the F-35 remains an affordable, lethal and effective war-winning platform in support of our National Defense Strategy. I thank you again for the

opportunity to appear before this subcommittee, and look forward to continued dialogue with you and your staff throughout the coming years.