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THE U.S. HOUSE OF REPRESENTATIVES

STATEMENT OF

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F-35 LIGHTNING II PROGRAM

BEFORE THE

READINESS AND TACTICAL AIR LAND FORCES SUBCOMMITTEES

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

F-35 PROGRAM UPDATE: SUSTAINMENT, PRODUCTION, AND AFFORDABILITY
CHALLENGES

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I Introduction

Chairmen Garamendi and Norcross, Ranking Members Lamborn and Hartzler, and distinguished Members of the Subcommittees, thank you for this opportunity to discuss the status and future of the F-35 Lightning II Program. First, please allow me to extend a sincere “Thank You” for your support of the F-35 program and the authority for Economic Order Quantity procurement for production lots 15-17 in the National Defense Authorization Act for Fiscal Year 2020.

Since the last time F-35 program leadership appeared before this committee, we have continued to simultaneously execute along the Development, Production, and Sustainment lines of effort that are critical to the present and future of this Air System and the Joint and International warfighters that depend on it for their nation’s safety, security, and stability. The game-changing capability the F-35 brings to the fight demonstrates the value of effective U.S. and global strategic partnerships. I am proud to represent the F-35 Enterprise and to inform you of the progress we’ve made in modernizing and sustaining this aircraft now deployed in combat operations around the world. My team, together with our industry partners, continues to aggressively pursue mission critical operational requirements for this tri-service, international 5th generation air system ensuring that it remains relevant in an ever-changing threat environment. From a modernization perspective, Block 4 is the key set of capabilities that will define the F-35 in the 2020s, and we are diligently and incrementally working to deliver it today. Our work with the U.S. Services and the Department to understand future threats and assess additional future required capabilities is a rigorous and constant process. By establishing a Capability Verification environment in which our newly-developed capabilities may be demonstrated to be effective, the Development foundation being put in place as part of our Block

4 efforts will provide the bedrock for the continuous delivery of these future capabilities, based on requirements and U.S. Services prioritization and future allocated resources.

As evidenced recently with the award of F-35 Production Lots 12-14, we continue to drive down production costs, delivering increasing numbers of new production aircraft to our domestic and international partners, and making wholesale improvements to the readiness and sustainment posture of the growing global fleet. As of today, our effective and “combat proven” F-35 Air System beddown includes more than 458 air systems delivered, eight Initial Operating Capability (IOC) declarations, 11 First Aircraft Arrivals across nine nations and F-35s operating at 18 bases around the globe.

II Driving Change in the Right Direction...Sustainment costs down, MC rates up

As the operational fleet grows, we must continue to emphasize affordability as we mature our Global Sustainment Solution and drive reductions in current and future Operating and Support (O&S) costs. While much work remains ahead of us, the program is demonstrating a downward glideslope in O&S costs. In 2019 alone, the program realized a nine percent reduction in Cost Per Flying Hour (CPFH) when compared to last year’s numbers.

We’ve also seen improvements in our Aircraft Mission Capable (MC) rates. Actions undertaken by the F-35 Enterprise and by our warfighting maintainers in 2019 increased the MC rate of our operational fleet from 54.7% in October of 2018 to 72.5% in September of 2019. Across the services, over the same time period, the U.S. Air Force increased from 66% to 75% MC for the F-35A, the U.S. Marine Corps increased from 44% to 68%, and the U.S. Navy achieved 75%. This summer, forward deployed USAF units from Hill Air Force Base in Utah reported MC rates above 80% since July with recent Full Mission Capability (FMC) rates of 89% and 92% in September and October, respectively.

Much of this progress is due to actions the F-35 Enterprise has implemented as a result of the publication and execution of our 2019 Life Cycle Sustainment Plan (LCSP), but an equal amount of credit goes to the Airmen, Marines, and Sailors maintaining the F-35 Air System in the field. There has been much debate as to which actions best drive improvements in cost and capability metrics, for our maintainers. We have come to realize there is no silver bullet in this arena; a coordinated effort across a wide spectrum of initiatives is required. For the F-35 Enterprise, this coordinated effort is articulated in the F-35 Life-Cycle Sustainment Plan (LCSP). Even though this plan was only signed earlier in 2019 we already are seeing tangible benefits from the synergies across the Success Elements of this plan and evidence, through metrics, that they are driving down O&S costs and improving aircraft availability.

To measure our performance and align with the Services needs and funding levels, the F-35 JPO established near-term targets to measure progress towards these through the FYDP and beyond. These targets are:

- i. F-35A: \$4.1M CPTPY (CY12\$), across 2036-41, achieve by 2036*
- ii. F-35B: \$6.8M CPTPY (CY12\$), across 2033-37, achieve by 2033*
- iii. F-35C: \$7.5M CPTPY (CY12\$), across 2036-43, achieve by 2036*
- iv. F-35C: \$25.2K CPFH (CY12\$), same timeframe as above*

The LCSP also contains a stretch goal measure of \$25K CPFH by 2025 for the F-35A (CY12\$). Current estimates for DoD F-35 CPFH shows a projection of \$32.2K in 2024 and \$30.7K in 2025 (CY12\$) and for the F-35A a projection of \$32.5K in 2024 and \$31.7K in 20-25 (CY12\$). The difference between this estimate of \$31.7K and the stretch goal of \$25K by 2025 reflects the work we have to do as a global Enterprise. The F-35 Program is tracking progress to the Success Elements of the LCSP through a set of primary metrics (those CPTPY and CPFH

targets listed above) and lower-level supporting metric data, which include the following rates: Mission Capable, Full Mission Capable, Out of Reporting, Non-Mission Capable and Non-Mission Capable Maintenance. The Success Elements identified in the LCSP are the key enablers to the program's overall ability to meet these targets and continue on a path to driving O&S cost down while improving aircraft availability. These elements are highlighted below:

Accelerate Fleet Modifications: The expedited completion of Non-Recurring Engineering, Material Procurement and Installation of components is on track to provide the warfighter the required capability to meet mission needs. An expedited plan was formalized and agreed to by the Services, Partners, and Foreign Military Sales Customers this past June. Today, all associated contract actions required to execute the 15-month acceleration of the Tech Refresh-2 (TR-2) upgrade have been awarded. To date, 45 of the 94 planned TR-2 upgrades are already complete with the remaining installations on track to complete in September 2020.

Accelerate Intermediate Level Maintenance and Maintenance Plan Changes: A minimum of 27 maintenance plan changes will be executed, giving our Airman, Sailor, and Marine maintainers the ability to perform maintenance tasks that today are restricted to contractor personnel. These changes better align the F-35 sustainment Enterprise with the more familiar organic approach in support of the warfighter, with an additional benefit of a total estimated life cycle cost avoidance of \$245M. A clear example of putting our maintainers first is a new set maintenance plans that will enable Navy maintainers at sea aboard a U.S. Navy aircraft carrier to execute intermediate-level avionics maintenance actions onboard rather than shipping the part or component to a Military Service Depot or Original Equipment Manufacturer as required today.

Accelerate Supply Chain Capability: The F-35 Sustainment Supply enterprise continues to mature while supporting the warfighter with a focus on delivering and improving affordable fleet

readiness. The percentage of the fleet non-mission-capable awaiting spare parts (NMC-S) increased through early 2019, but has steadily decreased since summer. As of October 2019, the NMC-S rate was under 15% for our operational fleets and 24% for our non-operational, testing and training fleets. The fraction of time that our maintainers found the part they needed on the shelf when they needed it remained steady through 2019 and our ability to provide the maintainer with a part not readily available on base improved by 26%.

We have reduced the total repair time of parts by 13%, continue to accelerate the implementation of Performance Based Agreements and Master Repair Agreements with commercial repair providers, and have accelerated the stand-up of organic depots. In line with the LCSP, the program is accelerating spares deliveries through targeted supplier engagement, enhanced tools for proactive actions, and streamlined integration efforts between the sustainment teams and supply chain management. Sustainment Supply performance of the propulsion system through FY19 has exceeded resourced targets with a NMC-S rate of 2% for modules and piece parts combined.

As an enterprise, our contracts are transitioning away from ones that feature purely cost-focused incentives and now feature incentive structures to drive contractor behavior. For development efforts, these incentives facilitate the early transition to Agile-enabled processes. Our production contracts – including the Lot 12-14 contract – feature Supplier Incentive Fees and Performance Incentive Fees that drive cost reduction at the supplier level and improve production line velocity. Our sustainment contracts incentivize MC rates and supplier metrics that ensure our warfighters have the aircraft they need when they need them.

We also continue to look for ways to improve the business relationships with our industry partners, enabling them to make better deals on our behalf and driving better program outcomes.

Some of our ongoing efforts include potential multiple year and multi-year contracts for production, and Performance-Based Logistics – or PBL – contracts for sustainment. In fact, we are working today with Lockheed Martin to define the parameters of a Sustainment PBL that meet our warfighter’s operational demands, our taxpayers’ best value demands and our Enterprise’s demands for greater organic involvement in F-35 sustainment.

Accelerate Depot Repair Capability: Throughout 2019 we have supported more than 60 deployments around the globe, to include operational and non-operational theatres. Our effort to increase the supply chain continues as we stand-up new F-35 bases and establish new Transfer Locations to get spare parts to the warfighter, wherever they are operating.

In 2019, the program leveraged the organic power of the U.S. Services and U.S. Government agencies and began transitioning warehousing and transportation workloads. In 2020, the Defense Logistics Agency (DLA) will manage F-35 warehousing and U.S. Transportation Command (TRANSCOM) will manage 90% of the transportation requirements for the program. Finally, by the end of CY20 we project all sustainment contracts will be operating in a multiple year environment, enabling a cost savings by incentivizing investment for long-term outcomes.

In 2020 we will leverage the warehousing capacity of the U.S. Defense Logistics Agency (DLA) in North America and the world-wide transportation and distribution capacity of the both DLA and TRANSCOM through the Joint Deployment and Distribution Enterprise. At the end of October, the Program declared Initial Operating Capability (IOC) of our F-35 European Regional Warehouse in the Netherlands, the first OCONUS regional warehouse. In 2020 we will stand-up an Asia-Pacific Regional Warehouse in Australia, which will continue to improve our supply chain responsiveness by reducing transportation times to our Services, Partners and Customers in that region. The Global Sustainment Solution is truly coming to life.

Depot Activations for Air Vehicle and Engine Line Replaceable Units (LRU) in 2019 were ahead of schedule with 28 Air Vehicle workloads activated so far and two more to follow by the end of the year, and 16 Engine LRUs have been activated. In addition, the first OCONUS Air Vehicle Regional Maintenance, Repair, Overhaul and Upgrade (MRO&U) operation in Cameri, Italy declared Initial Depot Capability (IDC).

We are also beginning the activation phase of six additional Air Vehicle LRU workloads, bringing total activations to 36 at the end of 2020, of 68 planned core workloads to be completed by 2024- six years earlier than originally planned. In addition, the Air Vehicle Regional MRO&Us in Australia and Japan, and the Propulsion Regional MRO&Us in Australia and the Netherlands will activate in 2020.

Improve ALIS Sustainment Functionality & Responsiveness: The ALIS 3.0 software release in the fall of 2018 met the required capabilities under the System Design and Development (SDD) Phase of the F-35, and ALIS currently performs all functions supporting the F-35 Sortie Generation Process today.

With that said, I also recognize that the current ALIS system requires significant additional improvements to enable improved operational and supportability outcomes. We are therefore shifting the ALIS development strategy. This means we are pivoting to agile development, then racing to a minimum viable system, where teams deliver enough features to satisfy our users and learn from their feedback early in the development process. With the delivery of the ALIS 3.5 capability this month, we anticipate there will be no further major releases on the legacy ALIS system, only minor enhancements as required. Block 4 ALIS capabilities will be rolled into a government managed backlog, and we will focus on delivering a modern maintenance system. To pivot to an agile implementation, we are establishing a modern organizational structure that

can support modern software development, embrace the need to change and focus on warfighter value.

Our ALIS transformation leverages industry Information Technology experts, academia, and commercial best practices. Key to our success in the future will be our ability to scale product teams, aggressively eliminate manual maintenance and operational processes to drive down complexity and cost, and tackle common 80% requirements while designing for edge cases. One of the biggest cost drivers for the current ALIS system is the administrative cost. Current Operations and Sustainment (O&S) costs for ALIS, over its lifecycle, are estimated at \$29.5 billion. Today, combat coded squadrons require 12 system administrators to maintain deployed operations, in addition to home station operations. Training squadrons require eight system administrators in order to support a two-shift operation. As we transform ALIS into a 21st Century maintenance system, we are specifically targeting reductions in the number of administrators required to support ALIS operations in the field. Upcoming software releases include the capability for centralized administration, bulk administration of Portable Maintenance Aids, and squadron resource sharing. These initiatives will reduce the requirements for on-site administration of the current ALIS system with an estimated decrease in life cycles costs of \$1.9 billion, nearly a 6.5% cost reduction. As the team builds the future ALIS system, a primary focus is to reduce administration costs even further.

Enhance RMIP: The F-35 Reliability and Maintainability Improvement Program (RMIP) identifies and implements projects for design change, retrofit/modification, and process improvements to increase reliability and maintainability (R&M) of all aspects of the F-35 Enterprise. Projects include component redesigns, qualification of consumables for F-35 integration, repair procedure creation and qualification, as well as improvements to off-aircraft

systems such as support and pilot flight equipment. Taking both cost and performance into account, RMIP prioritizes projects based on return on investment. RMIP has integrated with our Affordability War Room and Cost Teams to ensure that Life Cycle Cost improvements are accurately applied to the Annual Cost Estimate.

The F-35 RMIP will continue through the lifecycle of the F-35, continually identifying R&M improvements across the F-35 Enterprise. As of October 2019, accelerating Reliability and Maintainability (R&M) improvement efforts increased F-35 Mission Capability (MC) rates by a validated 2.7% with a projected MC rate increase of greater than 7.4% based on in-work and identified projects. To date 161 projects have been identified, with 68 completed. In total, these projects have a projected life cycle cost avoidance of \$10.6 Billion.

Accelerate Software Modernization: Traditional waterfall software development approaches cannot deliver warfighting capabilities at the rate or affordability required to lead turn emerging threats in a growing battlespace. The F-35 Joint Program Office and Lockheed Martin are progressing together toward a software modernization goal of merging F-35 software development and sustainment efforts using agile methodologies to shorten the software development cycle and rapidly deliver high-quality code that drives these capabilities.

Today, our Block 4 software capabilities are being designed, coded, and tested in a collaborative agile environment. Software developers, testers, and users utilize tailored toolsets and automation where able to accelerate the corrective feedback loop resulting in more refined software sooner. The goal is to rapidly send software capabilities to formal lab or aircraft verification testing with maximum probability of first pass success. As we continue to refine our agile development process, we are also pursuing the expansion of network and cloud access to F-35 software development and testing toolsets to leverage the capacity and expertise of

government, industry, and Partner entities as a software development force multiplier.

III Ensuring progress to plan

While much work remains ahead, the program is already demonstrating a downward glide slope to achieving O&S cost. I am personally committed to ensuring we have speed factored into our plans for meeting the aircraft's affordability and availability targets. We have a number of efforts in progress to ensure rapid, tangible cost reductions in FY20. Our "180-Day Sprint" initiative captures all of these fast-paced efforts that drive a near-term focus and rapid progress on actions that will "move the needle" from an Air System perspective and give our warfighting customers confidence that we are making real progress. The 180-Day Sprint provides the administrative structure to employ agile planning tactics, which included a joint effort between Industry and the U.S. Services to develop and deliver an affordable sustainment Life Cycle Sustainment Plan of Action and Milestones; an engagement plan to solicit improvement ideas; an agile Sustainment Improvement Program to enable rapid and consistent evaluation of and investment in Cost Reduction Initiatives, Reliability and Maintainability Improvement Program initiatives, Maintenance Planning improvements, Prognostic Health Management updates, and quick investments in Science and Technology where they make sense – all of which will enable us to provide the Services' desired cost reductions and performance improvements on the most aggressive timelines possible.

A key component to our enduring progress is our continued dialogue with the General Accounting Office (GAO) and our ability to fully address those concerns highlighted by their recent reporting. The F-35 program has made significant progress on a number of challenges outlined by the GAO to include supply chain management, improvements to reliability and preparation for future modernization efforts.

We have concurred with the vast majority of the GAO's recent recommendations and are striving to implement solutions and mitigations in each of the areas discussed in their 2019 reports. Specifically, I would point to our progress in working with our Industry Partner to address the difficult challenge associated with acquiring necessary F-35 provisioning and cataloging data that will assist us in the development of a DOD-led supply chain management capability for the F-35. We now have a contract in place that will require Lockheed Martin to build and deliver a Data Management Plan addressing selecting criteria for F-35 system and sub-systems and technical data deliveries, a supporting Integrated Master Schedule, and a Rough Order of Magnitude (ROM) cost estimate for the delivery of data associated with these systems and sub-systems. This will be a heavy lift, and our government teams will need to work closely with Lockheed Martin so that we fully understand the complexities and any risks involved in working through these technical data deliveries and their impacts to our future supply chain improvements – but we have now started that process. I thank our GAO leadership and teams for working with us to “dig-in” to the program's challenges, including supply chain management, and I look forward to a continued dialogue as we head into 2020.

IV Conclusion

The F-35 Enterprise is making great strides across our three lines of effort. In development, the C2D2 process is maturing and has begun delivering highly relevant increments of capability over time. Production continues to ramp as demonstrated with the recent Lot 12-14 contract award and we will continue to demand the highest quality from our industry partners and to aggressively drive cost out of the production line, just as we've demonstrated in this latest award. I can assure you that I am committed to following through on our commitments to improve Mission Capable Rates, particularly among our forward deployed squadrons, and

driving down operating costs for the global fleet. Throughout, I will ensure my teams continue to execute with diligence, discipline, and dedication. We serve with the single-minded determination that the U.S. and its allies will never fight a fair fight, that our warfighters will return home safely from every engagement, and that our taxpayers get the absolute best capability for their defense dollar.