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STATEMENT

BY

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BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

TACTICAL AIR AND LAND FORCES AND READINESS SUBCOMMITTEES

ON

CURRENT STATE OF F-35 INITIAL OPERATIONAL TEST AND EVALUATION

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Chairman Norcross, Chairman Garamendi, Ranking Member Hartzler, Ranking Member Lamborn and distinguished members of the committees, I appreciate the opportunity to provide the current state of F-35 Initial Operational Test and Evaluation (IOT&E) and to address F-35 readiness for combat.

In my written testimony, I will discuss four main topics:

1) Progress in the ongoing F-35 IOT&E, which will support a full-rate production decision.
2) A summary of the remaining test events and the path to completing IOT&E.
3) A summary of the requirements and readiness of the F-35 Joint Simulation Environment (JSE).
4) F-35 sustainment observations from an operational test perspective.

Status of IOT&E

The JSF Operational Test Team (JOTT) has been making positive progress on safely and effectively executing the IOT&E test plan. DOT&E has been collaborating closely with the JOTT, the F-35 Joint Program Office (JPO) and Service operational test agencies to ensure test adequacy to evaluate the F-35's lethality, survivability and readiness. Testing to date has included open-air test missions, actual weapons employment, cybersecurity, deployments, and comparison testing with fourth generation fighters against traditional and more contemporary fielded threats.

In order to complete IOT&E as efficiently as possible and provide timely feedback to the warfighter, I approved early increments of the IOT&E test plan that were ready for execution, up

to 11 months prior to the formal start of IOT&E. The first increment began in January 2018 with a JOTT deployment to Alaska for cold-weather testing. In April 2018, I approved a second increment that included missions in permissive threat environments, weapons, cybersecurity, and deployments to ships and austere operating locations. These test missions were primarily two-ship formation scenarios, designed to evaluate the F-35 in the roles of Close Air Support, Forward Air Controller (Airborne), Strike Coordination and Reconnaissance, Combat Search and Rescue, and Aerial Reconnaissance. Additionally, numerous air-to-air missile shots and air-to-ground munitions events were completed in operationally realistic scenarios. The JOTT also conducted deployments to the USS *Abraham Lincoln* with the F-35C; to Volk Field, Wisconsin with the F-35A; and to Marine Corps Air Station Yuma, Arizona with the F-35B. As prescribed in the FY17 National Defense Authorization Act, the test teams also completed the F-35A and A-10C comparative test missions in late March 2019. Since 2016, preceding the start of IOT&E, test teams have completed multiple rounds of periodic operational cybersecurity testing of the Autonomic Logistics Information System (ALIS), training systems, and the U.S. Reprogramming Laboratory for mission data at Eglin AFB, Florida, as well as component-level cybersecurity testing of the air vehicle.

In coordination with the Office of the Under Secretary of Defense for Acquisition and Sustainment and the F-35 JPO, I approved the start of formal IOT&E in December 2018 after the applicable remaining entrance criteria were met. The JOTT then began testing the F-35 in demanding open-air test missions designed to evaluate the roles of Offensive and Defensive Counter Air, including Cruise Missile Defense, Suppression/Destruction of Enemy Air Defenses, and Air-to-Surface Attack in higher-threat environments. The two final phases of formal IOT&E, which I will approve when the associated test infrastructure requirements are met, are

electronic warfare testing against robust surface-to-air threats at Point Mugu Sea Range (PMSR), California, and testing against dense, modern, surface and air threats in the JSE at Naval Air Station Patuxent River, Maryland.

As of today, the JOTT has completed 91 percent of the open-air test missions and weapons events, along with the majority of the suitability and cybersecurity events. The JOTT finished most of the open-air testing in September, including all planned missions at the Nevada Test and Training Range (NTTR). To conserve resources and save time, I also approved several reductions to planned testing based on having already collected enough data or obvious outcomes that did not require further testing. For example, I reduced planned F-16/F-18 comparison testing from 18 test missions to two missions, which saved roughly 192 sorties and $19 million in test range and operations costs. I also deleted 13 other planned test missions because we had already collected sufficient data, saving approximately $9 million.

Remaining IOT&E Events

The remaining formal IOT&E test events include test missions off the West Coast, at PMSR, missile and bomb events, cybersecurity test events, and testing in the JSE. The JSE test missions will be used to supplement the open-air test data against near-peer threats in higher densities. Missions in the JSE include Offensive and Defensive Counter Air, such as Cruise Missile Defense, Suppression/Destruction of Enemy Air Defenses, and Air-to-Surface Attack.

Preparations for test missions at PMSR are ongoing. In coordination with NTTR, range management at PMSR began accepting additional Radar Signal Emulator (RSE) threat systems from NTTR in October 2019. The RSEs are used to represent contemporary fielded threats that add realism to the open-air test missions. By early calendar year 2020, 13 RSEs will be in place and are expected to be ready to support the electronic warfare missions at PMSR in March.

Joint Simulation Environment (JSE) Requirement and Status

The F-35 JSE at NAS Patuxent River, Maryland, is a man-in-the-loop synthetic environment that utilizes the actual aircraft software. It is designed to provide a scalable, high-fidelity simulation that replicates realistic combat environments. JSE will be the only venue available, other than actual combat against peer adversaries, to adequately evaluate the F-35 because of the inherent limitations associated with open air testing. These limitations do not permit a full and adequate test of the aircraft against the required types and densities of modern threat systems (weapons, aircraft, electronic warfare) currently fielded by near-peer adversaries. Additionally, the JSE is a critical element in developing and testing the next-generation Block 4 capabilities for the F-35. Integrating the F-35 into the JSE is a very complex challenge but is essential to completing IOT&E, which will lead to the final IOT&E report.

A high-fidelity modeling and simulation environment is a long-standing requirement for adequate F-35 testing. The JSF Operational Requirements Document (ORD), Change 3, dated 19 August 2008, captured the full combat capability and threat environment requirements through the System Development and Demonstration phase of the program. The ORD also lists threat requirements at Initial Operating Capability (IOC) and IOC+10. The majority of these ORD-required threats are not available in open-air test.

The requirement for an IOT&E simulation environment was further documented when the Department re-baselined the program following the 2010 Nunn-McCurdy breach. This resulted in an Acquisition Decision Memorandum, dated 2 June 2010, that directed the program to develop a simulation environment on a schedule consistent with plans for conducting IOT&E. In 2015, the F-35 JPO and USD(AT&L) decided to move the F-35 simulation from a contractor venue to the JSE, which is a government-owned system. The initial schedule indicated that the

JSE would be operational by the end of FY17 to support IOT&E spin-up and testing. The current schedule indicates that the JSE will be ready to start the final phase of operational testing in the last quarter of FY20.

F-35 Readiness for Combat

The operational suitability of the F-35 fleet remains at a level below Service expectations. However, after several years of remaining relatively stable, several key suitability metrics are showing signs of slow improvement in CY19.

The fleet-wide monthly availability rate for U.S. aircraft, for the 12 months ending September 2019, was below the target of 65 percent. However, the DOT&E assessment of the trend shows evidence of slight overall improvement in U.S. fleet-wide availability during 2019. In particular, while the average monthly availability for the 12 months ending September 2019 was only a few percent higher than the average monthly availability for the 12 months ending September 2018, the F-35 fleet's monthly availability generally slowly increased in 2019, and recently achieved historic program highs that approached the target availability rate.

No portion of the fleet, including the combat-coded fleet, was able to achieve and sustain the 80 percent Mission Capable rate goal set by then Secretary of Defense Mattis. However, individual units were able to achieve the 80 percent target for short periods during deployed operations. Similar to the trend in aircraft availability, the Mission Capable and Full Mission Capable rates of the whole U.S. fleet improved slightly in 2019. Full Mission Capable rates lagged the overall Mission Capable rates by a large margin, indicating low readiness for operational missions that require fully capable aircraft. All three variants achieved roughly similar Mission Capable rates, but significantly different Full Mission Capable rates. The F-35A displayed the best Full Mission Capable performance, while the F-35C fleet had the lowest Full

Mission Capable rate; the F-35B's Full Mission Capable rate was roughly midway between the other two variants. The recent improvement in availability and MC rates was supported largely by greater availability of spare parts (through the program's initiative to buy more spares) and longer-term efforts to improve maintenance processes and depot support.

None of the F-35 variants is meeting either the reliability or the maintainability metrics that are specified in the ORD. For reliability, the specific metrics are Mean Flight Hours Between Critical Failure (MFHBCF), Mean Flight Hours Between Removal (MFHBR), and Mean Flight Hours Between Maintenance Event Unscheduled (MFHBME_Unsch). For maintainability, the metrics are Mean Corrective Maintenance Time for Critical Failures (MCMTCF) and Mean Time To Repair (MTTR).

Although the F-35A accumulated the flight hours designated for maturity in July 2018, to date it has not been able to meet any of the ORD's full reliability or maintainability requirements for mature aircraft. The F-35B and F-35C have not yet reached their flight hours designated for maturity and thus were assessed against interim goals. The results show that neither the F-35B nor F-35C currently is on track to meet ORD reliability or maintainability requirements when they attain flight-hour maturity. In short, for all variants, aircraft are breaking more often than planned and taking longer to fix.

My F-35 IOT&E report will provide final results and analysis after completion of the IOT&E. Due to operational security concerns, the majority of the report will be classified appropriately. For these reasons, I cannot discuss specific IOT&E results in this public hearing; however, I would be happy to provide preliminary observations in the appropriate venue.

As always, my staff and I stand ready to address any questions or concerns you may have. This concludes the prepared portion of my testimony and I look forward to answering the committee's questions. Thank you.