



INSPECTOR GENERAL

Department of Defense

MAY 21, 2018



(U) Air Force's F-15 Eagle Passive/Active Warning and Survivability System

~~Classified By: Theresa S. Hull, Assistant Inspector General,
Acquisition, Contracting, and Sustainment~~

~~Derived From: Multiple Sources~~

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(U) Results in Brief

(U) Air Force's F-15 Eagle Passive/Active Warning and Survivability System

May 21, 2018

(U) Objective

(U) We determined whether Air Force officials updated the Eagle Passive/Active Warning and Survivability System (EPAWSS) test and evaluation master plan to respond to concerns raised by Air Force and DoD test officials, developed an EPAWSS design that can meet capability requirements, and evaluated the F-15C EPAWSS production plan during the engineering and manufacturing development phase.

(U) Background

(U) The Air Force's EPAWSS program is an acquisition category IC major defense program with estimated program costs of \$876 million in research, development, test, and evaluation, and \$3.4 billion in procurement.¹ EPAWSS upgrades F-15C and F-15E aircraft electronic warfare capabilities to detect and identify air and ground threats, employ counter-measures, and jam enemy radar signals. The F-15 is an all-weather, day and night, tactical fighter aircraft designed to gain and maintain control over the battlefield.

(U) In November 2016, EPAWSS program officials started the engineering and manufacturing development phase of the acquisition cycle and began to develop, build, and test EPAWSS prototypes to verify that capability requirements have been met and to support production decisions. In August 2019, EPAWSS program officials plan to begin production and installation of EPAWSS on F-15 aircraft. The Air Force planned to upgrade 196 F-15C and 217 F-15E aircraft with EPAWSS during the production phase.

¹ (U) An acquisition category IC program has research, development, test, and evaluation costs of more than \$480 million or procurement costs of more than \$2.79 billion.

(U) Finding

(U) EPAWSS program officials updated the test and evaluation master plan to respond to concerns raised by Air Force and DoD test officials. Additionally, EPAWSS program officials developed an EPAWSS design that can meet capability requirements.

~~(FOUO)~~ Furthermore, in September 2016, the Air Force fully funded the EPAWSS program through production to satisfy an urgent need for modernized F-15 electronic warfare capabilities. However, in February 2017, the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements (DCS AF/A5/8) cancelled the upgrade of 196 F-15C aircraft with EPAWSS and removed [REDACTED] from F-15C EPAWSS procurement funds, which resulted in a 47 percent decrease of the total program production quantity.

(U) The quantity decrease of the F-15C EPAWSS production units and the removal of funds occurred because the DCS AF/A5/8 decided to use F-15C EPAWSS procurement funds to develop a higher priority air superiority program. However, DCS AF/A5/8 officials did not request Joint Requirements Oversight Council revalidation to verify whether the quantity decrease that was over 10 percent would adversely impact the warfighter's capability.

(U) As a result, Air Force officials do not know the full impact to other aircraft missions within and across the portfolios and Services without Joint Requirements Oversight Council revalidation of the decrease of F-15C EPAWSS production quantities. Using the F-15C aircraft without EPAWSS will limit the warfighter's ability to detect and identify air and ground threats, employ counter-measures, and jam enemy radar signals.

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(U) Results in Brief

(U) Air Force's F-15 Eagle Passive/Active Warning and Survivability System

(U) Recommendations

(U) We recommend the DCS AF/A5/8 request that the Joint Requirements Oversight Council revalidate the F-15C EPAWSS quantity to ensure that air superiority missions can still be met without the F-15C EPAWSS. Additionally, we recommend the DCS AF/A5/8 issue revised [REDACTED] that includes F-15C EPAWSS procurement funds if Congress does not approve the F-15C aircraft retirement.

(U) Management Comments and Our Response

(U) The Director of Staff for DCS, Strategic Plans, Programs, and Requirements, responding for the DCS AF/A5/8, agreed with and addressed all specifics of the recommendations. The Director of Staff stated that Air Force officials would submit the updated EPAWSS

(U) production quantity to the Joint Requirements Oversight Council for review and revalidation by first quarter 2019. In addition, the Director of Staff stated that Air Force officials would provide Congress with specific plans and justifications for retiring the F-15C aircraft. If Congress does not approve the F-15C aircraft retirement, the Director of Staff stated that Air Force officials would review the requirement and restore procurement funding for sufficient EPAWSS quantities to provide increased F-15C electronic warfare capabilities, as the mission requires. Therefore, these recommendations are resolved but will remain open. We will close these recommendations once we verify that the Joint Requirements Oversight Council has revalidated the decrease of F-15C EPAWSS production quantities or Air Force officials restore procurement funds if Congress does not approve the F-15C aircraft retirement.

(U) Please see the Recommendations Table on the next page for the status of the recommendations.

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**INSPECTOR GENERAL
DEPARTMENT OF DEFENSE**
4800 MARK CENTER DRIVE
ALEXANDRIA, VIRGINIA 22350-1500

May 21, 2018

(U) MEMORANDUM FOR AUDITOR GENERAL, DEPARTMENT OF THE AIR FORCE

(U) SUBJECT: Air Force's F-15 Eagle Passive/Active Warning and
Survivability System (Report No. DODIG-2018-121)

(U) We are providing this report for your information and use. We conducted this audit in accordance with generally accepted government auditing standards.

(U) We considered management comments on the draft of this report when preparing the final report. Comments from the Office of the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements, addressed all specifics of the recommendations and conformed to the requirements of DoD Instruction 7650.03; therefore, we do not require additional comments.

(U) We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 604-9312 (DSN 664-9312).

A handwritten signature in cursive script, reading "Theresa S. Hull".

Theresa S. Hull
Assistant Inspector General
Acquisition, Contracting, and Sustainment

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(U) Introduction

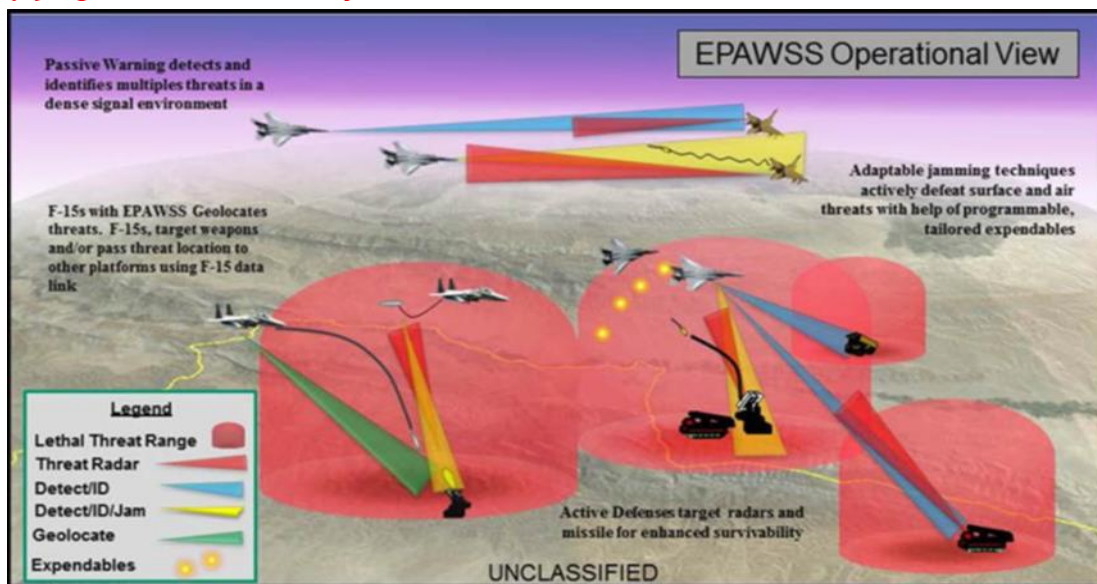
(U) Objective

(U) We determined whether Air Force officials updated the Eagle Passive/Active Warning and Survivability System (EPAWSS) test and evaluation master plan (TEMP) to respond to concerns raised by Air Force and DoD test officials, developed an EPAWSS design that can meet capability requirements, and evaluated the F-15C EPAWSS production plan during the engineering and manufacturing development (EMD) phase. See Appendix A for a discussion of the audit scope and methodology and prior coverage and Appendix B for a list of [REDACTED].

(U) Background

(U) The Air Force's EPAWSS program is an acquisition category IC major defense program with estimated program costs of \$876 million in research, development, test, and evaluation, and \$3.4 billion in procurement.² The legacy F-15 electronic warfare system used 1970s technology which has limited capability to detect, locate, deny, degrade, and disrupt modern and advanced enemy threats. The EPAWSS program upgrades F-15C and F-15E aircraft electronic warfare capabilities to detect and identify air and ground threats, employ counter-measures, and jam enemy radar signals. The F-15 is an all-weather, day and night, tactical fighter aircraft designed to gain and maintain control over the battlefield. The EPAWSS program acquisition strategy indicated the need for the F-15 EPAWSS capability was urgent. The figure shows an operational view of the F-15 EPAWSS.

² (U) An acquisition category IC program has research, development, test, and evaluation costs of more than \$480 million or procurement costs of more than \$2.79 billion.

(U) Figure. F-15 EPAWSS Operational View

(U) Source: EPAWSS Program Office.

(U) EPAWSS Program Stakeholders and Responsibilities

(U) The EPAWSS Program Manager is located at Wright-Patterson Air Force Base, Ohio. The EPAWSS Program Manager reports to the F-15 System Program Manager under the Program Executive Office for Fighters and Bombers, Wright-Patterson Air Force Base, Ohio. The Air Combat Command (ACC) at Langley Air Force Base, Virginia, developed the EPAWSS program capability requirements. The ACC organizes, trains, equips, and maintains combat ready forces needed for peacetime and wartime air defense.

(U) In September 2014, the Joint Requirements Oversight Council (JROC) validated the EPAWSS capability requirements and EPAWSS production quantities for F-15C and F-15E aircraft. JROC manages and prioritizes warfighter needs within and across the capability requirement portfolios. The Principal Deputy Assistant Secretary of the Air Force (Acquisition and Logistics) is the milestone decision authority (MDA), the final decision maker for program reviews. In November 2016, the Principal Deputy approved the Milestone B review for the EPAWSS program to begin the EMD phase of the acquisition process. DoD Instruction 5000.02 states that Milestone B is a critical decision point in an acquisition program because resources are committed for system development in the EMD phase.³ The Instruction also states that the purpose of the EMD phase is to develop, build, and test a product to verify that capability requirements have been met and support production decisions. In August 2019, EPAWSS program officials plan to obtain the MDA approval for Milestone C to begin production and

³ (U) DoD Instruction 5000.02, "Operation of the Defense Acquisition System," Change 3 Incorporated, August 10, 2017.

(U) installation of EPAWSS on F-15 aircraft. The Air Force planned to upgrade 196 F-15C and 217 F-15E aircraft with EPAWSS during the production phase.

(U) Table 1 summarizes additional key DoD and Air Force organizations responsible for overseeing, evaluating, resourcing, or directing the EPAWSS program to ensure the Air Force achieves its required air defense capabilities.

(U) Table 1. Additional Key Organizations Responsible for the EPAWSS Program

(U)	Organizations	Responsibilities for the EPAWSS Program
	The Office of the Director, Operational Test and Evaluation	Oversees and evaluates operational test plans and results
	The Office of the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation	Reviews and evaluates developmental test plans and results
	The Office of the Assistant Secretary of the Air Force (Acquisition)	Directs, guides, supervises, and/or approves acquisition plans, policies, and programs
	The Office of the Assistant Secretary of the Air Force (Financial Management and Comptroller)	Provides financial management and analytical services necessary for the effective and efficient use of Air Force resources
	The Office of the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements	Provides guidance, oversight, and direction for planning the total forces; also responsible for development of Air Force capability requirements
	The Office of the Director, Headquarters Air Force Test and Evaluation	Oversees developmental and operational tests; also responsible for policies and resources
	Program Executive Office for Fighters and Bombers, Air Force	Oversees development and acquisition of fighters and bombers, including EPAWSS

(U)

(U) Source: The DoD OIG.

(U) F-15C and F-15E Portfolios and Missions

(U) The F-15C aircraft perform air-to-air missions and are part of the Air Superiority portfolio. The purpose of the Air Superiority portfolio is to gain and maintain air dominance across all military operations and threat environments. The Air Force executes air superiority missions in offensive and defensive environments. The F-15E aircraft is a dual-role fighter designed to perform air-to-air and air-to-ground missions and is part of the Global Precision Attack portfolio. The purpose of the Global Precision Attack portfolio is to deliver worldwide global support through air interdiction, strategic attack, and close air support.⁴

⁴ (U) Air interdiction is interruption, delay, or destruction by air of enemy forces approaching the battle area.

(U) Acquisition, Requirements, and Budgeting Guidelines

(U) DoD Instruction 5000.02 states that acquisition, requirements, and budgeting are closely related processes; moreover, those responsible for the three processes at the DoD level and within DoD Components must work closely together to adapt to changing circumstances, as needed, and to identify and resolve issues as early as possible. The Instruction further states that throughout a product's life cycle, adjustments may have to be made to keep the three processes aligned. Acquisition programs may have to adjust to changing requirements and funding availability. Budgeted funds may have to be adjusted to make programs executable or to adapt to evolving validated requirements and priorities. The Instruction also states that stable requirements and funding are important to successful program execution.

(U) The Joint Capabilities Integration and Development System (JCIDS) manual states that JROC initiates a review of capability requirements based upon "first knowledge" of unit cost, schedule, or quantity changes that reach values outlined in the validation JROC Memorandum (JROCM).⁵ When the Vice Chairman of the Joint Chief of Staff, JROC, approved and validated the EPAWSS capability requirements, he issued JROCM 101-14, [REDACTED]. JROCM 101-14 states that EPAWSS must return to JROC for revalidation if EPAWSS production quantity decreases by 10 percent or more.

(U) Review of Internal Controls

(U) DoD Instruction 5010.40 requires DoD organizations to implement a comprehensive system of internal controls that provides reasonable assurance that programs are operating as intended and to evaluate the effectiveness of the controls.⁶ We identified an internal control weakness with the F-15C EPAWSS quantity reduction. Specifically, the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements (DCS AF/A5/8), did not request revalidation (through JROC) of the F-15C EPAWSS quantity to ensure the decrease would not adversely impact the warfighter's capability. We will provide a copy of the report to the senior Air Force official responsible for internal controls.

⁵ (U) Manual for the Operation of the Joint Capabilities Integration and Development System, updated December 18, 2015.

⁶ (U) DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013.

(U) Finding

(U) Air Force Officials Updated the Test and Evaluation Master Plan and Developed a Stable Design, But Did Not Obtain JROC Revalidation for Significant Quantity Decreases

(U) EPAWSS program officials updated the TEMP to respond to concerns raised by Air Force and DoD test officials. Additionally, EPAWSS program officials developed an EPAWSS design that can meet capability requirements.

~~(FOUO)~~ Furthermore, in September 2016, the Air Force fully funded the EPAWSS program through production to satisfy an urgent need for modernized F-15 electronic warfare capabilities. However, in February 2017, the DCS AF/A5/8 cancelled the upgrade of 196 F-15C aircraft with EPAWSS and removed [REDACTED] from F-15C EPAWSS procurement funds, which resulted in a 47 percent decrease of the total program production quantity.

(U) The quantity decrease of the F-15C EPAWSS production units and the removal of funds occurred because the DCS AF/A5/8 decided to use F-15C EPAWSS procurement funds to develop a higher priority air superiority program. However, DCS AF/A5/8 officials did not request JROC revalidation to verify whether the quantity decrease that was over 10 percent would adversely impact the warfighter's capability, as required by the JROCM 101-14. A JROC revalidation was necessary to review and assess how the quantity decreases would affect missions.

(U) As a result, Air Force officials do not know the full impact to other aircraft missions within and across the portfolios and Services without JROC revalidation of the decrease of F-15C EPAWSS production quantities. Using the F-15C aircraft without EPAWSS will limit the warfighter's ability to detect and identify air and ground threats, employ counter-measures, and jam enemy radar signals.

(U) EPAWSS Program Officials Updated the Test and Evaluation Master Plan and Developed a Stable Design

(U) EPAWSS program officials updated the TEMP to respond to concerns by Air Force and DoD test officials, and developed an EPAWSS design that can meet capability requirements. DoD

Instruction 5000.02 states that the purpose of the EMD phase is to develop, build, and test a product to verify that capability requirements have been met

and support production decisions. Test and evaluation and system design are critical to the EMD phase to ensure EPAWSS can meet an urgent need for modernized F-15 electronic warfare capabilities.

(U) EPAWSS program officials updated the TEMP to respond to concerns by Air Force and DoD test officials, and developed an EPAWSS design that can meet capability requirements.

(U) EPAWSS Program Officials Updated the Test and Evaluation Master Plan

(U) EPAWSS program officials updated the TEMP to respond to concerns raised by Air Force and DoD test officials.⁷ The TEMP is the primary test planning and management document. The TEMP includes an event-driven test schedule that outlines sufficient time to support testing, evaluation, and reporting. Test and evaluation activities should reduce program risks by identifying and resolving design deficiencies as early as possible.

(U) Before the EPAWSS program entered the EMD phase, Air Force and DoD test officials evaluated the EPAWSS draft TEMP and concluded that the TEMP did not include sufficient test details, test activities, and test aircraft to evaluate EPAWSS during the EMD phase. For example:

- (U) The Director, Air Force Test and Evaluation, stated that EPAWSS program officials had not scheduled enough developmental tests to support the Milestone C review and begin initial production.
- (U) The Deputy Assistant Secretary of Defense for Developmental Test and Evaluation stated that the number of test aircraft was insufficient to evaluate the F-15 EPAWSS before the Milestone C review and approval to begin initial production.

⁷ (U) Test officials included personnel from the offices of the Director, Air Force Test and Evaluation; the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation; and the Director, Operational Test and Evaluation.

- (U) The Director, Operational Test and Evaluation, stated that the TEMP lacked the detail to determine whether adequate resources and time were available to support EPAWSS capability development and testing.

(U) EPAWSS program officials added details and identified resources in the updated TEMP to show that sufficient developmental ground and flight tests will occur before initial production. Program officials also added detailed descriptions of developmental ground test events, two F-15 aircraft to support operational tests, and an adequate schedule to support tests. For these reasons, on October 2, 2017, EPAWSS program officials obtained final TEMP approval from all Air Force and DoD test officials.

(U) EPAWSS Design Can Meet Capability Requirements

(U) EPAWSS program officials developed an EPAWSS design that can meet capability requirements. DoD Instruction 5000.02 states that program officials must ensure the system design is stable in the EMD phase before building developmental test prototypes. The Instruction requires program officials to conduct a critical design review, which confirms that the system design can meet capability requirements and is used as a decision point to begin building developmental test prototypes.

(U) At the end of March 2017, the EPAWSS Program Manager briefed the MDA that the EPAWSS critical design review was completed, the system design was mature, and the program was ready to begin developmental test prototype production. EPAWSS program officials completed the critical design review 37 days ahead of schedule. Additionally, a senior leader from the Air Force Life Cycle Management Center, Directorate of Engineering, reported to the Office of the Assistant Secretary of the Air Force (Acquisition), Directorate of Science, Technology, and Engineering, that the EPAWSS exhibited a high likelihood of accomplishing the EPAWSS mission in the intended environment and was on track to meet capability requirements.

(U) The DCS AF/A5/8 Cancelled F-15C EPAWSS Production After Full Funding Certification

(FOUO) In September 2016, the Air Force fully funded the EPAWSS program through production to satisfy an urgent need for modernized F-15 electronic warfare capabilities. However, in February 2017, the DCS AF/A5/8 cancelled the upgrade of 196 F-15C aircraft with EPAWSS and removed [REDACTED] from F-15C EPAWSS procurement funds. The F-15C EPAWSS quantity was 47 percent of the total program production quantity.

(FOUO) ...the DCS AF/A5/8 cancelled the upgrade of 196 F-15C aircraft with EPAWSS and removed [REDACTED] from F-15C EPAWSS procurement funds.

(U) Section 2366b, title 10, United States Code (10 U.S.C. §2366b) and DoD Instruction 5000.02 require the MDA to certify that funding is expected to be available to execute product development and production.⁸ Accordingly, in September 2016, the MDA and the Assistant Secretary of the Air Force (Financial Management and Comptroller) certified that the F-15 EPAWSS program was fully funded through production. In February 2017, the DCS AF/A5/8 directed Air Force officials to reduce F-15C EPAWSS procurement funds starting in FY 2020. The DCS AF/A5/8 did not cancel procurement funds for 217 F-15E EPAWSS units. Table 2 summarizes the F-15C EPAWSS procurement funds reduction.

(U) Table 2. F-15C EPAWSS Procurement Funds Reduction

(FOUO)	FY 2018 (\$M)	FY 2019 (\$M)	FY2020 (\$M)	FY2021 (\$M)	FY2022 (\$M)	Total (\$M)
Original F-15C EPAWSS Procurement Funds	█	█	█	█	█	█
DCS AF/A5/8 Directed Adjustment	█	█	█	█	█	█
Revised F-15C EPAWSS Procurement Funds	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
						(FOUO)

(U) Note: EPAWSS program officials plan to start F-15C EPAWSS production in FY 2020. Therefore, the FY 2018 budget request only included F-15C EPAWSS procurement funds for FY 2020 through FY 2022 and did not include funds for FY 2023 and beyond.

(U) Source: DCS AF/A5/8 and the DoD OIG.

(U) The DCS AF/A5/8 Reduced the F-15C EPAWSS Production Quantity More Than 10 Percent But Did Not Request JROC Revalidation

(U) In February 2017, the DCS AF/A5/8 decided to use F-15C EPAWSS procurement funds to develop a higher priority air superiority program. However, DCS AF/A5/8 officials did not request JROC revalidation to verify whether the quantity decrease that was over 10 percent would adversely impact the warfighter’s capability, as required by the JROCM 101-14. A JROC revalidation was necessary to review and assess how the quantity decreases would affect missions. DCS AF/A5/8 officials decided to wait for the results of a scheduled March 2018 congressional briefing of the F-15C aircraft, which includes F-15C EPAWSS procurement cuts and retirement of the F-15C aircraft before proceeding with JROC revalidation.

⁸ (U) 10 U.S.C. § 2366b (2017), “Major defense acquisition programs: certification required before Milestone B approval.”

(U) Retirement of F-15C Aircraft

(S) In February 2017, the DCS AF/A5/8 issued the [REDACTED] [REDACTED] to retire the F-15C aircraft beginning in [REDACTED] and fully retire the aircraft by the end of [REDACTED]. However, [REDACTED]

[REDACTED] The [REDACTED] communicated the Air Force’s long-term strategic intention to build and sustain a capable, right-sized Air Force and directed program resource allocation. The DCS AF/A5/8 planned to use F-15C EPAWSS procurement funds to develop a higher priority Air Superiority program.⁹

(U) A hearing titled “The Current State of the U.S. Air Force” was held before the Subcommittee on Readiness of the House Committee on Armed Services in March 2017. During the hearing, Air Force officials testified that they would deliberate whether to retire the F-15C during FY 2019 budget planning. The House Committee on Armed Services directed Air Force officials to provide a briefing on options and plans for the F-15C aircraft retirement. Specifically, Air Force officials planned to brief the Committee in March 2018 on the Air Force’s system sustainment and service-life plans for the F-15C aircraft, including EPAWSS integration. Additionally, Air Force officials planned to brief how and when the Air Force plans to grow its fighter squadron capacity. If the Air Force plans to retire the F-15C aircraft, Air Force officials will brief on:

- (U) its materiel options to replace the F-15C air superiority mission capability and capacity;
- (U) DoD analysis that validates whether upgraded F-16 aircraft can replace a modernized F-15C aircraft in the Air Superiority portfolio; and
- (U) transition plans for locations that support the F-15C aircraft, personnel, operations, or maintenance activities.

⁹ (S) [REDACTED]

(U) F-15 EPAWSS Quantity Change Not Validated by JROC

(U) JROCM 101-14 states that EPAWSS must return to JROC for revalidation if EPAWSS production quantity decreases by 10 percent or more. In February 2017, DCS AF/A5/8 officials did not request JROC revalidation of the F-15C EPAWSS quantity to ensure the 47 percent decrease would not adversely impact the warfighter’s capability. In December 2017, we asked Air Force officials why they had not followed the JROCM 101-14 requirement. Air Force officials provided these responses:

(U) ...DCS AF/A5/8 officials did not request JROC revalidation of the F-15C EPAWSS quantity to ensure the 47 percent decrease would not adversely impact the warfighter’s capability.

- (U) the EPAWSS Program Manager stated that program officials will revalidate production quantities through JROC before the scheduled (2019) Milestone C;
- (U) an ACC official stated that he has requested restoration of (F-15C) EPAWSS procurement funds in the FY 2020 budget request; [therefore, these funds were not in the FY 2019 budget request]; and
- (FOUO) DCS AF/A5/8 officials did not respond to our request even though they cancelled the upgrade of 196 F-15C aircraft with EPAWSS and removed [REDACTED] from F-15C EPAWSS procurement funds.

(U) Air Force officials did not explain why they did not return to JROC upon “first knowledge” of the cancellation of F-15C EPAWSS production quantities in February 2017.¹⁰

(U) Additionally, in December 2017, the Branch Chief, Strategic and Tactical Systems, Joint Staff J-8 Capabilities and Acquisition Division, confirmed that Air Force officials had not requested JROC revalidation of the F-15C EPAWSS quantity. The Branch Chief stated that he thought Air Force officials were waiting for the results from the planned March 2018 Congressional briefing and subsequent discussions and legislation.

(U) Joint Staff officials prioritize and validate DoD capability requirements to guide acquisitions and budgetary resources using the JCIDS process. The JCIDS manual requires JROC revalidation review of the (EPAWSS) program to:

- (U) assess whether the change can be mitigated and still provide meaningful capability to the warfighter;
- (U) understand the impact of the change to the capability solution;

¹⁰ (U) The JCIDS manual states that first knowledge may be determined by events such as budget reviews.

- (U) review the impacts to both the (EPAWSS) program and other programs within and across the portfolios;
- (U) reevaluate the operational risks associated with the decreased (EPAWSS) quantity;
- (U) consider whether any alternatives are more appropriate to satisfy the (F-15C EPAWSS) requirements; and
- (U) determine whether to revalidate, and if not revalidated, recommend alternative approaches to mitigate (F-15C) diminished capability or rescind the original validation.

(U) DoD Instruction 5000.02 states that stable requirements and funding are important for successful program execution. An ACC official stated that Air Force officials would request JROC to revalidate the F-15 EPAWSS quantity if the funding for the F-15C EPAWSS production did not get restored before the scheduled 2019 Milestone C review to begin initial production. However, the JROC-validated EPAWSS capability requirements should influence the program funding for successful program execution. The JCIDS manual states that capability requirements inform budgetary decisions and any changes to the budget may impact the operational risk to the warfighter.

(U) The DCS AF/A5/8 decision to cancel the upgrade of 196 F-15C aircraft with EPAWSS—a 47 percent decrease in the total program production quantity—may adversely impact the program’s ability to satisfy an urgent need for modernized F-15 electronic warfare capabilities and could limit the warfighter’s capability. The DCS AF/A5/8 should work closely with JROC to identify and resolve issues as early as possible. Therefore, the DCS AF/A5/8 should request JROC to revalidate the F-15C quantity so that appropriate assessments and reviews occur to ensure the air superiority mission can still be met without the F-15C EPAWSS. Additionally, the DCS AF/A5/8 should issue revised [REDACTED] that includes F-15C procurement funds if the House Committee on Armed Services does not approve the F-15C aircraft retirement.

(U) Conclusion

(U) Air Force officials do not know the full impact to other aircraft missions within and across the portfolios and Services without JROC revalidation of the decrease of F-15C EPAWSS production quantities. Using the F-15C aircraft without EPAWSS will limit the warfighter’s ability to detect and identify air and ground threats, employ counter-measures, and jam enemy radar signals. Air Force officials developed EPAWSS to address an urgent need for improved F-15 electronic warfare capabilities.

(U) In September 2016, Air Force officials originally planned to upgrade 196 F-15C aircraft with EPAWSS during the production phase. However, in February 2017 the DCS AF/A5/8 cancelled all F-15C EPAWSS production units without returning to JROC for revalidation of the EPAWSS quantity change. A JROC revalidation is necessary to review and assess the revised Air Force need for F-15C aircraft missions without EPAWSS, and to assess the impacts of the change on other aircraft missions.

(U) Management Comments on the Finding and Our Response

(U) Office of the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements, Comments

(U) The Director of Staff for DCS, Strategic Plans, Programs, and Requirements, responding for the DCS AF/A5/8, recommended a change to a sentence in the conclusion because Air Force officials would be able to support air superiority mission requirements with minimal impact to other aircraft missions without EPAWSS-equipped F-15C aircraft.

{S} The Director of Staff stated the Air Force’s decision to retire F-15C aircraft by [REDACTED] and remove F-15C EPAWSS funding was made after careful consideration of the impacts of the Air Force’s ability to meet National Security Strategy and National Defense Strategy mission requirements. [REDACTED]

Moreover, he stated that the Air Force plan balances capacity, capability, and affordability while meeting air superiority mission requirements with minimal impact to other mission sets. He also stated that Air Force officials would present their assessment for JROC validation when they submit the EPAWSS capability document for JROC review.

{S} Furthermore, the Director of Staff recommended we remove the sentence, “However, [REDACTED]

[REDACTED]” The Director of Staff stated that EPAWSS is designed to provide electronic warfare capabilities to operate and survive in a [REDACTED]. He stated that the homeland defense mission is conducted in [REDACTED].

{S} The Director of Staff stated that the [REDACTED]

(U) The Director of Staff also stated that ACC officials would update the EPAWSS procurement quantity and acquisition costs for the system to be integrated on F-15E aircraft in the capability document. Furthermore, he stated Air Force officials would submit the capability document to JROC for review and revalidation of air superiority requirements by first quarter 2019.

(U) Our Response

(U) The Director of Staff comments addressed all specifics of the recommendation; therefore, this recommendation is resolved but will remain open. We will close the recommendation once we verify that the JROC has revalidated the F-15C EPAWSS quantity.

(U) Recommendation 2

(U) We recommend the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements, issue revised [REDACTED] that includes F-15C Eagle Passive/Active Warning and Survivability System procurement funds if Congress does not approve the F-15C aircraft retirement.

(U) Office of the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements, Comments

(U) The Director of Staff for DCS, Strategic Plans, Programs, and Requirements, responding for the DCS AF/A5/8, agreed with the recommendation, and stated that Air Force officials would provide Congress specific plans and justifications for retiring the F-15C aircraft. If Congress does not approve the F-15C aircraft retirement, he stated that Air Force officials would review the requirement and restore procurement funds for sufficient EPAWSS quantities to provide increased F-15C electronic warfare capabilities as the mission requires.

(U) Our Response

(U) The Director of Staff addressed all specifics of the recommendation; therefore, this recommendation is resolved but will remain open. We will close the recommendation once we verify that Air Force officials have restored procurement funds if Congress does not approve the F-15C aircraft retirement.

(U) Appendix A

(U) Scope and Methodology

(U) We conducted this performance audit from August 2017 through March 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

(U) Review of Documentation and Interviews

(U) To determine whether Air Force officials were on track to develop, build, and test a product during the first year of the EMD phase, we reviewed EPAWSS program documents dated between September 2014 and October 2017. We reviewed program documents pertaining to test and evaluation, system design, and funding for F-15 EPAWSS production. For example, we reviewed:

- (U) The Office of the Director, Operational Test and Evaluation, Approval of the F-15 Eagle Passive/Active Warning and Survivability System Milestone B Test and Evaluation Master Plan, Version 2.1, October 2017;
- (U) [REDACTED]
- (U) Air Force Life Cycle Management Center Memorandum, "F-15 Eagle Passive/Active Warning and Survivability System Critical Design Review Independent Technical Review Report," March 2017;
- (U) [REDACTED];
- (U) [REDACTED]
- (U) Test and Evaluation Master Plan for F-15 Eagle Passive/Active Warning and Survivability System, Milestone B, Version 2.1, January 2017;
- (U) F-15 Eagle Passive/Active Warning and Survivability System, Systems Engineering Plan, Version 2.0, July 2016;
- (U) Test and Evaluation Master Plan for F-15 Eagle Passive/Active Warning and Survivability System, Milestone B, Version 2.0, December 2015;

- (U) Tailored Acquisition Strategy for F-15 Eagle Passive/Active Warning and Survivability System, Version 1.0, October 2014;
- (U) Joint Requirements Oversight Council Memorandum 101-14, "[REDACTED]" and [REDACTED];
- (U) [REDACTED]

(U) To meet our objective, we reviewed the following guidance:

- (U) Section 2366b, title 10, United States Code, "Major defense acquisition programs: certification required before Milestone B approval," December 11, 2017;
- (U) The JCIDS Manual, updated December 18, 2015;
- (U) DoD Directive 5000.01, "The Defense Acquisition System," November 20, 2007;
- (U) DoD Instruction 5000.02, "Operation of the Defense Acquisition System," Change 3 Incorporated, August 10, 2017;
- (U) Air Force Policy Directive 99-1, "Test and Evaluation," June 3, 2014;
- (U) Air Force Policy Directive 10-6, "Capability Requirements Development," November 6, 2013; and
- (U) Air Force Instruction 63-101/20-101, "Acquisition/Logistics-Integrated Life Cycle Management," May 9, 2017.

(U) We visited the EPAWSS program office, the ACC, and the Headquarters Air Force. We interviewed Air Force officials to understand their role in planning, managing, executing, or overseeing the EPAWSS program during the EMD phase.

(U) Additionally, to obtain an understanding of decisions made to begin the EMD phase and the program progress, we interviewed officials from the offices of the:

- (U) Director, Operational Test and Evaluation;
- (U) Deputy Assistant Secretary of Defense for Developmental Test and Evaluation;

- (U) Deputy Assistant Secretary of Defense for Systems Engineering; and
- (U) Air Force Life Cycle Management Command, Engineering Directorate.

(U) To understand the reduction of procurement funds to upgrade 196 F-15C aircraft with EPAWSS, and the potential impact to the warfighter's capability of using the F-15C without EPAWSS, we also interviewed officials from the following offices:

- (U) Joint Chiefs of Staff, J-8, Capabilities and Acquisition Division;
- (U) Assistant Secretary of the Air Force (Acquisition);
- (U) DCS AF/A5/8; and
- (U) ACC, Requirements Sponsor and Core Function Support Teams.

(U) Use of Computer-Processed Data

(U) We did not use computer-processed data to perform this audit.

(U) Prior Coverage

(U) During the last 5 years, the Government Accountability Office (GAO) issued six reports discussing the F-15 EPAWSS program. Unrestricted GAO reports can be accessed at <http://www.gao.gov>.

(U) GAO

(U) Report No. GAO-18-360SP, "Weapon Systems Annual Assessment: Knowledge Gaps Pose Risks to Sustaining Recent Positive Trends," April 2018

(U) Air Force officials completed a stable system design with 99 percent of drawings released. In December 2017, Air Force officials started modifications to test aircraft to integrate EPAWSS. However, Air Force officials will not install EPAWSS hardware on test aircraft until July 2018 after the scheduled lab testing of a system prototype in April 2018. The top development risks identified by Air Force officials were EPAWSS performance in a real-world radio frequency signal environment and the availability of needed test resources. Air Force officials also tracked EPAWSS software development as EPAWSS reused and integrated a large amount of code from three different contractors. Furthermore, Air Force officials are separately managing several other F-15 aircraft modifications efforts that must be ready before EPAWSS testing can be completed and before fielding can begin.

(U) Report No. GAO-17-333SP, "Defense Acquisitions: Assessments of Selected Weapon Programs," March 2017

(U) Air Force officials stated that the March 2017 critical design review would focus on the integration of updated subsystem components that require hardware and software design work. Officials planned to complete ground testing and an operational assessment through flight testing of production representative hardware before making a production decision in 2019. However, GAO reported that about half of developmental flight testing would occur during production, which would expose the program to risk of unforeseen design or software changes. Air Force officials stated that they would continue testing to inform the critical design review and ensure system maturity in time to meet entrance criteria for the low-rate initial production decision.

(U) Report No. GAO-16-329SP, "Defense Acquisitions: Assessments of Selected Weapon Programs," March 2016

(U) Air Force officials planned to use non-developmental electronic warfare technologies and components used in other military aircraft. Officials identified the hardware and software on the digital receiver as a critical technology that is not expected to be fully mature at the start of system development. Officials identified software development and integration of the electronic warfare system with other off-board and on-board systems as a risk area.

(U) Report No. GAO-15-800R, "Department of Defense's Waiver of Competitive Prototyping Requirement for the Air Force F-15 Eagle Passive/Active Warning and Survivability System (EPAWSS) Program," September 2015

(U) The DoD's waiver rationale was consistent with the Weapon System Acquisition Reform Act and the supporting analysis considered a reasonable set of prototyping alternatives. Air Force officials determined that the prototyping costs greatly outweighed the benefits. Air Force's cost-benefit analysis supported the EPAWSS competitive prototype waivers.

(U) Report No. GAO-15-342SP, "Defense Acquisitions: Assessments of Selected Weapon Programs," April 2015

(U) Air Force officials planned to use non-developmental electronic warfare technologies and components. Officials identified that the digital receiver was not expected to be fully mature at the start of system

(U) development. Air Force officials identified EPAWSS risk areas including integration of the electronic warfare system with other F-15 systems; scope of software development; availability of test resources; limited simulation capabilities; and potential incompatibility with other F-15 radio frequency systems, which could require redesign and additional testing.

(U) Report No. GAO-14-340SP, "Defense Acquisitions: Assessments of Selected Weapon Programs," March 2014

(U) Air force officials identified the hardware and software on the digital receiver as a critical technology that was not expected to be fully mature at the start of system development. Officials identified software development and integration of the electronic warfare system with other off-board and on-board systems as a risk area.

(U) Appendix B

(U) [REDACTED]

(U) [REDACTED]
[REDACTED]

(U) [REDACTED]
[REDACTED]

(U) [REDACTED]

(U) [REDACTED]
[REDACTED]

(U) [REDACTED] and

(U) [REDACTED]
[REDACTED]

(U) Management Comments

(U) Office of the Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements

UNCLASSIFIED

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC



17 April 2018

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

FROM: HQ USAF/A5/8
1070 Air Force Pentagon
Washington, DC 20330-1070

SUBJECT: DoDIG Draft Report on F-15 Eagle Passive / Active Warning and Survivability System (EPAWSS); Project No. D2017-D0000AU-0177.00

1. Per your request, I have reviewed your Draft Report on the F-15 EPAWSS program, and provide the attached comments detailing my position on your report's Findings and Recommendations. These comments also include the actions the Air Force will take to specifically address the report's two recommendations.
2. My Staff has also conducted a Security Review of your report in preparation for Public Release per your request, and confirms that the sections within your report identified as Secret and FOUO are classified at the correct and appropriate level.
3. My Point of Contact for this response is [REDACTED], AF/A5RC
[REDACTED]

A handwritten signature in black ink, appearing to read "Omid Fattahi".

OMID FATTABI, GS-15, DAF
Director of Staff
DCS, Strategic Plans, Programs, and
Requirements

One Attach:

1. DoDIG EPAWSS Draft Report -- A5/8 Comments

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HQ USAF / A5/8 Comments on DoDIG Draft Report
F-15 Eagle Passive / Active Warning and Survivability System (EPAWSS)
(Project No. D2017-D000AU-0177.00)

(U) HQ USAF / A5/8 has reviewed the DoDIG's Draft Report on the Air Force's F-15 EPAWSS program, and Concur with the Report's two Recommendations.

(U) **RECOMMENDATION #1:** "We recommend the Deputy Chief of Staff of the AF, Strategic Plans and Requirements, request the Joint Requirements Oversight Council to revalidate the F-15C EPAWSS quantity to ensure air superiority missions can still be met without F-15C EPAWSS."

(S) **HQ USAF / A5/8 Response:** Concur as Written. The AF's decision to retire the F-15C fleet by [REDACTED] will be reviewed for approval as part of our FY19 Planning Choices. This plan to retire the F-15C fleet is the primary factor for our decision to reduce funding now for EPAWSS procurement and integration for the F-15C. However, the requirement to upgrade the Electronic Warfare capabilities for our F-15E fleet remains valid, and our plans to develop, procure, and integrate F-15 EPAWSS onto our F-15E fleet remain unchanged.

(U) In preparation for this decision to retire the F-15C fleet, Air Combat Command is preparing an update to the F-15 EPAWSS Capability Production Document (CPD), which will provide the updated procurement quantity and acquisition costs for the EPAWSS system to be integrated onto the AF's F-15E fleet. This updated EPAWSS CPD will be submitted for review through the standard JCIDS processes for eventual JROC review and re-validation of the air superiority requirements in a timely manner, with an Objective Goal of achieving JROC re-validation in 1stQTRCY2019. (ECD 31 Mar 2019)

(U) **RECOMMENDATION #2:** "We recommend the Deputy Chief of Staff of the AF, Strategic Plans and Requirements, issue revised [REDACTED] that includes F-15C EPAWSS procurement funding if Congress does not approve the F-15C aircraft retirement."

(U) **HQ USAF / A5/8 Response:** Concur as Written. The AF will provide Congress details on our plans to retire the F-15C fleet and the justifications for this decision. If Congress does not approve of this plan, the AF will take the appropriate action to review the requirement and restore procurement funding for sufficient quantities of the EPAWSS system to provide our F-15C fleet increased Electronic Warfare capabilities as required to meet mission needs. (TBD by Congress)

(U) HQ USAF / A5/8 further recommends the following change to the Report's Findings, cited throughout the report, and also cited in the Report's Conclusions:

(U) **Findings - Paragraph #4 / Conclusion – 1st Sentence:** "As a result, Air Force officials do not know whether they can support air superiority missions without F-15C EPAWSS. Further, AF officials do not know, without JROC validation, whether cancellation of the F-15C EPAWSS production quantities would impact other missions. Using the F-15C..."

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Final
Report
Reference

Revised
throughout
the Report

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(U) HQ USAF / A5/8 Recommended Change: "While the Air Force assesses that they will be able to support air superiority mission requirements with minimum impacts to other aircraft missions without EPAWSS equipped F-15Cs, this has yet to be validated by the JROC. Using the F-15C..."

(S) Justification: The Air Force's decision to retire the F-1C fleet by [redacted] and in turn remove funding for F15C EPAWSS, was made only after careful consideration of the impacts to our ability to meet National Security Strategy and the National Defense Strategy mission requirements. Our plans to retire the F-15C fleet by [redacted]

[redacted] The Air Force believes this plan best balances sufficient capacity, effective capability, and increased affordability, while still enabling us to meet air superiority mission requirements with minimal impact other mission sets. The Air Force will be prepared to present our assessment to the JROC for validation when we submit the EPAWSS CPD for JROC review.

(U) HQ USAF / A5/8 further recommends one additional change within the Report's "Retirement of the F-15C Aircraft" section on page 17:

(S) Paragraph #1, last line: "However, [redacted]"

(S) HQ USAF / A5/8 Recommendation and Justification: Remove. EPAWSS is designed to provide Electronic Warfare capabilities required to operate and survive in the [redacted]. The Homeland Defense mission will be conducted in a [redacted] and while the survivability increases provided by EPAWSS are critical for other mission sets conducted in [redacted]

(S) [redacted] However, [redacted] Ultimately, the ACC [redacted] statement on Homeland Defense capacity requirements does not justify the EPAWSS capability requirement for F-15C, and therefore should not be used as an example for the need to continue procurement of EPAWSS for the Air Force's F-15C fleet.

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Final Report Reference

Rearranged Sentences, Report Page 9

(U) Acronyms and Abbreviations

ACC	Air Combat Command
DCS AF/A5/8	Deputy Chief of Staff of the Air Force, Strategic Plans and Requirements
EMD	Engineering and Manufacturing Development
EPAWSS	Eagle Passive/Active Warning and Survivability System
JCIDS	Joint Capabilities Integration and Development System
JROC	Joint Requirements Oversight Council
JROCM	Joint Requirements Oversight Council Memorandum
MDA	Milestone Decision Authority
TEMP	Test and Evaluation Master Plan

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