Report No. DODIG-2021-133

~~CUI~~

INSPECTOR GENERAL

U.S. Department of Defense

SEPTEMBER 29, 2021

(U) Audit of Navy and Marine Corps Actions to Address Corrosion on F/A-18C-G Aircraft

~~Controlled by: DoD OIG~~
~~Controlled by: Audit/Readiness and Global Operations~~
~~CUI Category: PRIVILEGE; OPSEC; CTI~~
~~Distribution/Dissemination Control: FEDCON~~
~~POC: RGO Program Director;~~ [redacted]

INTEGRITY ★ INDEPENDENCE★ EXCELLENCE

~~CUI~~


INSPECTOR GENERAL
INTEGRITY
EFFICIENCY
DEPARTMENT OF DEFENSE

(U) Results in Brief

(U) Audit of Navy and Marine Corps Actions to Address Corrosion on F/A-18C-G Aircraft

September 29, 2021

(U) Objective

(U) The objective of this audit was to determine whether Navy and Marine Corps officials performed required inspections and maintenance to identify and address (prevent and correct) corrosion in F/A-18C-G aircraft and implemented, or plan to implement, technical directives to address corrosion on F/A-18C-G aircraft in accordance with DoD requirements.

(U) Background

(U) This audit was performed in response to a reporting requirement for the DoD Office of Inspector General contained in the House Armed Services Committee report that accompanied the National Defense Authorization Act for FY 2021. Specifically, the Committee directed us to review whether Department of the Navy (DON) maintainers performed organizational-level maintenance to address corrosion in F/A-18C-G aircraft.

(U) Squadron maintainers should perform organizational-level, corrosion-related inspections on F/A-18C-G aircraft every 84 calendar days (approximately 4 times per year). During the 84-day inspections, maintainers at the organizational level may identify an issue with the aircraft related to corrosion and document the issue in a maintenance action form. Additionally, the DON issued technical directives to provide technical information necessary to properly and systematically inspect or alter the configuration of aircraft, engines, systems, or equipment to address corrosion.

(U) Background (cont'd)

(U) The DON has extended the service life of F/A-18C-F aircraft. To modify the service life of these aircraft, the DON entered the aircraft into a service life assessment program that evaluated how the aircraft was flown compared to the original designed use. Upon completing the assessment program, the DON had an extended service life limit for the aircraft. Next, the DON developed service life extension programs that included modifications, repairs, inspections, or revised service intervals required to be performed on aircraft to reach the aircraft's extended service life limit. Fleet Readiness Centers, Marine Corps Air Stations, and contractors provide the services for the service life extension programs.

(U) Finding

(U) According to DON records, at the organizational (squadron) level, maintainers generally reported that they performed required 84-day inspections, completed associated maintenance actions, and implemented technical directives designed to address (prevent and correct) corrosion on F/A-18C-G aircraft.

(~~CUI~~) Specifically, we found that DON maintainers did not perform required 84-day inspections in FY 2020 for [redacted] of the 151 aircraft in our sample, and did not provide a valid reason for why the inspections were not performed or why the DON lacked the records to show that the inspections occurred. Also, DON maintainers did not complete [redacted] maintenance actions and did not provide a valid reason for not completing the maintenance actions.

(U) Based on our analysis of the inspections, maintenance, contractor reports about organizational-level corrosion, and actions taken by the DON to improve the condition of aircraft entering the service life extension programs, we concluded that:

- (U) maintainers did not always perform the organizational-level inspections or maintenance to DON standards, and
- (U) officials responsible for oversight of organizational-level inspections and maintenance did not always identify and correct work that did not meet the standards.

(U) Results in Brief

(U) Audit of Navy and Marine Corps Actions to Address Corrosion on F/A-18C-G Aircraft

(U) Finding (cont'd)

(U) According to DON officials, the House Armed Services Committee report, and three reports that we reviewed from the contractors performing the service life extensions, aircraft entering the service life extension process had corrosion that DON maintainers should have identified at the organizational level. Based on reporting by the contractor to the DON and the House Armed Services Committee, the DON took actions to improve the condition of aircraft entering the service life extension programs, including additional training, meetings, coordination, and detailed inspections.

(~~CUI~~) Ensuring that organizational-level inspections and maintenance are performed to DON standards is crucial because the DON spends billions to address corrosion on F/A-18C-G aircraft. Specifically, from FYs 2017 through 2020, the cost to the DON of addressing organizational-level corrosion for F/A-18C-G aircraft was more than $2 billion, and from FYs 2018 through 2020 the DON [redacted] mission capable availability rate goals of [redacted] for F/A-18C/Ds and EA-18Gs and [redacted] for F/A-18E/Fs. Furthermore, corrosion may contribute to mission capability rates. However, we do not know if corrosion contributed to the mission capability rates and, if so, the extent to which it contributed.

(U) Recommendations

(U) We recommend that the Commander, Naval Air Forces, direct the Strike Fighter Wing Atlantic, Strike Fighter Wing Pacific, 2nd Marine Air Wing, and 3rd Marine Air Wing to review the facts and circumstances surrounding the aircraft that did not have four 84-day inspections in FY 2020 and the aircraft that had maintenance actions open to determine whether there is a systemic problem and develop a solution to mitigate the problem. If no systemic problem exists, then the Commander, Naval Air Forces, should direct Wing officials to develop internal controls to ensure inspections occur and maintenance actions are completed.

(U) We also recommend that the Commander, Naval Air Forces, assess the actions implemented to address corrosion and determine whether these actions resulted in fewer instances of corrosion that should have been identified at the organizational level, reduced costs, or improved readiness. If the actions have not led to those results, then the Commander should identify alternate initiatives to address organizational-level corrosion inspection and maintenance.

(U) Management Comments and Our Response

(~~CUI~~) [redacted]

Furthermore, based on supporting documentation provided, we agree that [redacted] of the [redacted] aircraft had received four 84-day inspections in FY 2020 or had a valid reason for not receiving four inspections. However, the Commander, Naval Air Forces, did not provide documentation that showed the DON completed four 84-day inspections for [redacted] of the aircraft. Because the officials determined that the 84-day inspections occurred, there was no need for the DON to develop an internal control to address the lack of 84-day inspections at the Wing level. Therefore, the recommendation is resolved, but will remain open until the Commander, Naval Air Forces, provides maintenance records so we can verify that the remaining [redacted] aircraft received four 84-day inspections.

(~~CUI~~) [redacted]

(U) Results in Brief

(U) Audit of Navy and Marine Corps Actions to Address Corrosion on F/A-18C-G Aircraft

(U) Comments (cont'd)

(~~CUI~~) [redacted] Furthermore, we agree that [redacted] of the [redacted] maintenance actions have been closed. However, there is [redacted] aircraft with [redacted] maintenance actions that have not been closed as of August 2021. Because the officials determined that [redacted] of [redacted] maintenance actions were completed and we have requested additional information from the DON for the [redacted] remaining maintenance actions, there was no need for the DON to develop an internal control to address the maintenance actions that had not been closed at the Wing level. Therefore, the recommendation is resolved, but will remain open until the Commander, Naval Air Forces, provides maintenance records so we can verify that these [redacted] maintenance actions have been closed.

(~~CUI~~) [redacted]

(~~CUI~~) [redacted] We acknowledge that the DON implemented actions to address corrosion; however, the Deputy Assistant Chief of Staff did not state whether these actions have been assessed for effectiveness. Comments from the Deputy Assistant Chief of Staff did not address the intent of this recommendation; therefore, the recommendation is unresolved. To resolve this recommendation, we request that the Commander, Naval Air Forces, provide additional comments that explain how and when the DON will measure the effectiveness of the implemented actions taken to address corrosion and determine whether these actions resulted in fewer instances of corrosion, reduced costs, or improved readiness. If the Commander, Naval Air Forces, plans to use metrics other than those we specifically identified to measure success, we ask that the Commander describe those metrics. Once the DON has completed the assessment, we ask that the Commander, Naval Air Forces, provide us with a copy of the results. Please see the Recommendations Table on the next page for the status of recommendations.

(U) Recommendations Table

Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
(U) Commander, Naval Air Forces	3	1 and 2	None

(U) Please provide Management Comments by October 29, 2021.

(U) Note: The following categories are used to describe agency management's comments to individual recommendations.

- **(U) Unresolved** – Management has not agreed to implement the recommendation or has not proposed actions that will address the recommendation.
- **(U) Resolved** – Management agreed to implement the recommendation or has proposed actions that will address the underlying finding that generated the recommendation.
- **(U) Closed** – DoD OIG verified that the agreed upon corrective actions were implemented.

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

September 29, 2021

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION AND SUSTAINMENT
AUDITOR GENERAL, DEPARTMENT OF THE NAVY

SUBJECT: (U) Audit of Navy and Marine Corps Actions to Address Corrosion on F/A-18C-G Aircraft (Report No. DODIG-2021-133)

(U) This final report provides the results of the DoD Office of Inspector General's audit. We previously provided copies of the draft report and requested written comments on the recommendations. We considered management's comments on the draft report when preparing the final report. These comments are included in the report.

(U) Of the three recommendations in our report, two are resolved and one remains unresolved because the Deputy Assistant Chief of Staff, Aviation Maintenance and Material Readiness, responding for the Commander Naval Air Forces, did not address the intent of the recommendation presented in this report. As described in the Recommendations, Management Comments, and Our Response section of this report, we will close the resolved recommendations when you provide us with adequate documentation showing that all agreed-upon actions to implement the recommendations are completed. We will track the unresolved recommendation until an agreement is reached on the actions that you will take to address the recommendation, and you have submitted adequate documentation showing that all agreed-upon actions are completed.

(U) DoD Instruction 7650.03 requires that recommendations be resolved promptly. Therefore, please provide us within 30 days your response concerning specific actions in process or alternative corrective actions proposed on the recommendations. Send your response to either followup@dodig.mil if unclassified or rfunet@dodig.smil.mil if classified SECRET.

(U) We appreciate the cooperation and assistance received during the audit. If you have any questions, please contact me at [redacted], [redacted].

Richard B. Vasquez
Assistant Inspector General for Audit
Readiness and Global Operations


INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
INTEGRITY
EFFICIENCY

Contents

Contents (cont'd)

(U) Introduction

(U) Objective

(U) The objective of this audit was to determine whether Navy and Marine Corps officials performed required inspections and maintenance to identify and address (prevent and correct) corrosion in F/A-18C-G aircraft and implemented, or plan to implement, technical directives to address corrosion on F/A-18C-G aircraft in accordance with DoD requirements. See Appendix A for a discussion of the scope and methodology and prior audit coverage related to the objective.

(U) Background

(U) Corrosion

(U) The DoD defines corrosion as the deterioration of a material or its properties due to a reaction of that material with its chemical environment.[1] According to a March 2019 study contracted by the DoD, the estimated total annual cost of corrosion for Department of the Navy (DON) aviation assets (based on FY 2017 data) was $3.76 billion, or 27.2 percent of the DON's total maintenance expenditure of $13.8 billion.[2] In addition, the impact of corrosion on DON aviation availability was an estimated 4.5 million hours of non-availability for DON aviation and missiles (based on FY 2017 data), or 25.3 percent of the 17.6 million total hours of non-availability. According to the study, the F/A-18 Models E and F had the highest total corrosion cost among the DON's aviation assets for FY 2017.

(U) Report Requirement

(U) The House Armed Services Committee report that accompanied the National Defense Authorization Act for FY 2021 directed the DoD Office of Inspector General to:

> (U) provide a report to the congressional defense committees not later than September 30, 2021, that assesses all Active and Reserve Navy and Marine Corps F/A-18C/D/E/F/G aircraft squadrons regarding adherence to organizational and unit-level maintenance and repair technical orders and procedures prescribed by the original equipment manufacturer, in particular those processes and procedures designed to mitigate damage and degradation to the aircraft and structural components due to corrosion incurred by operations in harsh sand and salt-water environments.

[1] (U) Office of DoD Corrosion Policy and Oversight, "Corrosion Prevention and Control Planning Guidebook for Military Systems and Equipment," February 4, 2014.

[2] (U) LMI Study, "Estimated Impact of Corrosion on Cost and Availability of DoD Weapon Systems," FY 2019 Update, March 2019. The Department of the Navy refers to both the Navy and the Marine Corps.

(U) Aircraft Reviewed

(U) The Hornet series aircraft include Legacy Hornets (F/A-18 Models A-D), Super Hornets (F/A-18 Models E and F), and Growlers (EA-18G). Because the House Armed Services Committee requested that we report on F/A-18 Models C-G, we included those aircraft in our audit scope and excluded F/A-18 Models A and B. As of September 23, 2020, the DON had an inventory of 1,060 F/A-18C-G aircraft.

(U) The Legacy Hornet is an all-weather fighter and attack aircraft that is used for fighter escort, fleet air defense, force protection, and close and deep air support. The Legacy Hornet has single-seat (F/A-18 A and C) and two-seat (F/A-18 B and D) models. As of September 2020, the DON had 335 Legacy Hornets (F/A-18 Models C and D) assigned to training, test and evaluation, reserve, and fighter squadrons across the world. The DON has been flying Legacy Hornets since 1983. Figure 1 shows a Legacy Hornet D Model.

(U) Figure 1. F/A-18 Legacy Hornet D Model
(U) Source: The Defense Visual Information Distribution Service.

(U) The Super Hornet is a fighter and attack aircraft that provides escort and fleet air defense as well as offensive capabilities. The aircraft can target enemy fighter aircraft and attack ground and surface targets. The Super Hornet has increased maneuverability, range, and payloads compared to the Legacy Hornet. The Super Hornet has single-seat (F/A-18 E) and two-seat (F/A-18 F) models. The DON's first operational squadron of Super Hornets formed in 2001. As of September 2020, the DON had 563 Super Hornets assigned to training, test and evaluation, and strike fighter squadrons across the world. Figure 2 shows a Super Hornet E model and F model.

(U) Figure 2. F/A-18 Super Hornet E Model (bottom) and F Model (top)
(U) Source: The Defense Visual Information Distribution Service.

(U) The Growler is a variant of the Super Hornet with a sophisticated electronic warfare suite. The two-seat, electronic attack aircraft integrates electronic attack technology, including jamming pods, communication countermeasures, radar, and satellite communications. The DON has been flying Growlers since 2008. As of September 2020, the DON had 162 Growlers assigned to training, test and evaluation, reserve, and electronic attack squadrons across the world. Figure 3 shows a Growler.

(U) Figure 3. EA-18G Growler
(U) Source: The Defense Visual Information Distribution Service.

(U) DON Service Life Extension Programs

(U) The DON has extended the service life of both the Legacy Hornet and the Super Hornet. To modify the service life of these aircraft, the DON entered the aircraft into a service life assessment program that evaluated how the aircraft was flown compared to the original designed use. Upon completing the assessment program, the DON had an extended service life limit for the aircraft. Next, the

(U) DON developed service life extension programs that included modifications, repairs, inspections, or revised service intervals required to be performed on aircraft to reach the aircraft's extended service life limit. Fleet Readiness Centers, Marine Corps Air Stations, and contractors provide the services for the service life extension programs.

(~~CUI~~) There are different service life extension programs for Legacy Hornets and Super Hornets. The service life extension program for Legacy Hornets is called the high flight hour program. Legacy Hornets were originally designed to fly for 6,000 hours; however, the majority of aircraft have exceeded this service life. The high flight hour program has extended the service life of the Legacy Hornets to a maximum of 10,000 hours. There were two high flight hour program contracts that also included other maintenance and repair services for aircraft. The January 2014 contract had a period of performance that extended 540 calendar days after the last aircraft entered the high flight hour program and a total estimated base and all options value of about $428.9 million, as of modification 30 to the contract.[3] The April 2015 contract had a period of performance through April 2020 and a total estimated base and all options value of about $60.6 million, as of modification 16 to the contract.[4] The service life extension program for Super Hornets is called the service life modification program. Super Hornets were also originally designed to fly for 6,000 hours. The service life modification program has extended the service life of the Super Hornets to a maximum of 10,000 hours. The service life modification program contract also included other maintenance and repair services for aircraft. The contract had a period of performance from February 2018 through June 2023 and a total estimated base and all options value of about $458.7 million, as of modification 33 to the contract.[5] As of April 2021, [redacted] F/A-18C-F aircraft had entered a service life extension program, and [redacted] of those [redacted] aircraft had completed the program.

(U) According to the House Armed Services Committee report that accompanied the National Defense Authorization Act for FY 2021, Boeing, the original manufacturer of Legacy Hornets and Super Hornets and one of the contractors that provides services as part of the service life extension programs, identified corrosion-related maintenance problems that the DON should have identified and corrected during organizational-level maintenance. Organizational-level maintenance is maintenance completed by squadron maintainers.

[3] (U) Contract N00019-14-D-0001, Modification P00030, effective December 15, 2020.
[4] (U) Contract N00019-16-D-1003, Modification P00016, effective April 18, 2019.
[5] (U) Contract N00019-18-D-0001, Modification P00033, effective May 10, 2021.

(U) Organizations Involved in Identifying and Addressing Corrosion

(U) Several organizations are involved in identifying and addressing corrosion within the DON.

- (U) Naval Air Systems Command (NAVAIR)
- (U) Headquarters Marine Corps, Department of Aviation
- (U) The F/A-18 and the EA-18G Program Office (Program Manager Air [PMA]-265)
- (U) Commander, Naval Air Forces[6]
- (U) Naval Air Training Command
- (U) Strike Fighter Wings
- (U) An Electronic Attack Wing
- (U) Marine Air Wings

(U) NAVAIR provides full life-cycle support of naval aviation aircraft, weapons, and systems, including engineering, test and evaluation, repair, modification, and logistics support. In addition, NAVAIR manages the Decision Knowledge Programming for Logistics Analysis and Technical Evaluation–Aircraft Inventory and Readiness Reporting System (DECKPLATE-AIRRS), which maintains the DON's official aircraft inventory information. NAVAIR also manages the DECKPLATE Technical Directive and Kit Management Modules, which are automated systems designed to store, maintain, and disseminate information concerning the status of technical directives.

(U) Within NAVAIR, PMA-265 is responsible for the acquisition, development, and maintenance of Legacy Hornets, Super Hornets, and Growlers. PMA-265 has a Corrosion Action Team. The purpose of the Corrosion Action Team is to advise and assist the PMA-265 Program Manager in providing and maintaining a corrosion prevention plan for F/A-18 and EA-18G aircraft.

(U) Commander, Naval Air Forces, is the Type Commander for all active naval aviation units. Commander, Naval Air Forces Reserve, is the Type Commander for all reserve naval aviation units. Type commanders have overall responsibility for programs, personnel, and assets.

(U) The Chief of Naval Air Training leads Naval Air Training Command. The Chief of Naval Air Training is responsible for training Navy and Marine Corps combat aviators.

[6] (U) The name of the office is "Commander, Naval Air Forces." This is not referring to the position of the Commander.

(U) The Navy has two Strike Fighter Wings that fly Super Hornets and one Electronic Attack Wing that flies Growlers. The Marine Corps has four Marine Air Wings that fly Legacy Hornets. Each of these Wings comprises multiple squadrons. Each squadron has Military or contracted maintainers who perform organizational-level inspections and maintenance on the aircraft that belong to their respective squadron.

(U) Corrosion-Related Inspection Requirements at the Organizational Level

(U) Commander, Naval Air Forces Instruction 4790.2C, "The Naval Aviation Maintenance Program (NAMP)," requires scheduled special inspections.[7] NAVAIR determines at what interval the special inspections are required to occur. NAVAIR officials perform analysis, taking into consideration safety, environment, operations, and economics, to determine the optimal inspection interval. Officials at Commander, Naval Air Forces, then approve the inspection interval and communicate the requirement to the fleet.

(U) NAVAIR determined that squadron maintainers should complete organizational-level, corrosion-related inspections on F/A-18C-G aircraft every 84 calendar days (approximately 4 times per year). During the 84-day inspections, maintainers at the organizational level may identify an issue with the aircraft related to corrosion and document the issue in a maintenance action form. The maintenance action form includes specific information about the issue and the maintenance action required to correct it. Information on the 84-day inspections and the maintenance actions, including whether they were completed, are contained in DECKPLATE. The DON uses DECKPLATE to store information on inspections and maintenance for F/A-18C-G aircraft.

[7] (U) Commander, Naval Air Forces Instruction 4790.2C, "The Naval Aviation Maintenance Program (NAMP)," January 15, 2017, requires officials to complete scheduled special inspections on aircraft not in preservation. The NAMP defines a special inspection as a scheduled inspection with a prescribed interval other than daily, phase, major engine, or depot-level rework. Special inspection intervals are specified in technical publications with intervals based on elapsed calendar time, flight hours, operating hours, or number of cycles or events.

(U) Corrosion-Related Technical Directives at the Organizational Level

(U) A technical directive is a document authorized and issued by the NAVAIR Commander to provide technical information necessary to properly and systematically inspect or alter the configuration of aircraft, engines, systems, or equipment after establishing each baseline configuration. For this audit, we reviewed four types of organizational-level technical directives specifically related to addressing corrosion. The following bullets describe the types of technical directives that we reviewed.

1. (U) Bulletin Technical Directive. This type of directive includes airframe bulletins (AFBs) that direct an inspection to determine whether a given condition exists and specifies what action to take if the condition is found.
2. (U) Formal Change Technical Directive. This type of directive includes airframe changes (AFCs) that implement a configuration change and contain instructions and information to direct that material be added, removed, altered, relocated, or changed from an existing configuration.
3. (U) Age Exploration Technical Directive. This type of directive includes age exploration bulletins (AEBs) that gather and analyze user maintenance data to adjust preventative maintenance tasks and time intervals that the DON previously established.
4. (U) Accessory Technical Directive. This type of directive includes accessory bulletins (AYBs) and accessory changes (AYCs) that affect a removable repairable component, unit, subsystem, or system that is considered to be an accessory to a major system such as the airframe, engine, or engine module.

(U) What We Reviewed

(U) Our audit focused on corrosion identified and addressed at the organizational (squadron) level. Therefore, we reviewed the DON requirements for performing 84-day inspections, which the DON designed to identify and address corrosion, and the resulting maintenance actions associated with the 84-day inspections. We also reviewed the DON requirements for implementing 14 organizational-level technical directives related to corrosion. The Navy issued the technical directives that we reviewed between 1989 and 2020. We obtained an understanding of DECKPLATE and accessed it to retrieve information related to these inspections, maintenance actions, and technical directives. We also reviewed management actions taken within the DON to address corrosion and reviewed examples of contractor and fleet readiness center-produced reports for aircraft that completed one of the service life extension programs.

(U) We identified a statistical sample of DON aircraft upon which to conduct our analysis of the 84-day inspections and associated maintenance actions. From the universe of 1,060 F/A-18C-G aircraft, we selected a statistical sample of 151 aircraft based on stratifying the aircraft to group the Legacy Hornets (F/A-18C/D) into a category, the Super Hornets (F/A-18E/F) into a category, and the Growlers (EA-18G) as their own category. Our statistical sample represented the population from which it was selected. See Appendix B for a discussion of the sampling methodology. See Table 1 for the total aircraft by type and the number of aircraft in our sample and the number of aircraft that entered a service life extension program, as of April 2021.

(~~CUI~~) Table 1. Breakdown of DON Aircraft in Our Statistical Sample

(~~CUI~~) Aircraft	Universe	Total Aircraft That Entered a Service Life Extension Program	Sample	Sample Aircraft That Entered a Service Life Extension Program
F/A-18C, Legacy Hornet	235	[redacted]	32	[redacted]
F/A-18D, Legacy Hornet	100	[redacted]	16	[redacted]
F/A-18E, Super Hornet	306	[redacted]	39	[redacted]
F/A-18F, Super Hornet	257	[redacted]	41	[redacted]
EA-18G, Growler	162	[redacted]	23	[redacted]
Total	**1,060**	[redacted]	**151**	[redacted] **(~~CUI~~)**

(U) Source: The DoD OIG.

(U) Finally, we reviewed corrosion-related cost data from the Office of the Assistant Secretary of Defense for Sustainment's Maintenance and Availability Data Warehouse (MADW). MADW uses information from DECKPLATE to identify the costs associated with corrosion-related maintenance by weapon system, including F/A-18C-G aircraft. We also reviewed MADW data to identify the operational availability and mission capability of F/A-18C-G aircraft and whether the DON was meeting mission capable goals for the aircraft. Operational availability and mission capability are metrics that the DoD uses to measure the availability of a weapon system. Specifically, operational availability measures how the sustainment of a weapon system affects its availability to complete missions. Operational availability is the percentage of a weapon system in the inventory

(U) that is available for mission operations at any time. Mission capability is the percentage of a weapon system in the inventory that is assigned to operational units for performance of a mission.

(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.[8] We identified internal control weaknesses with DON personnel's manual entry of maintenance data that feeds into DECKPLATE. We will provide a copy of the report to the senior official responsible for internal controls at the DON.

[8] (U) DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013, Incorporating Change 1, June 30, 2020.

(U) Finding

(U) Records Showed That the DON Generally Inspected and Maintained Aircraft to Address Corrosion, but Work May Not Have Always Met DON Standards

(U) According to DON records, at the organizational (squadron) level, DON maintainers generally reported that they performed required 84-day inspections, completed associated maintenance actions, and implemented technical directives designed to address (prevent and correct) corrosion on F/A-18C-G aircraft. However, based on contractor reports about organizational-level corrosion and actions taken by the DON to improve the condition of aircraft entering the service life extension programs, we concluded that:

- (U) maintainers did not always perform the organizational-level inspections or maintenance to DON standards, and
- (U) officials responsible for oversight of organizational-level inspections and maintenance did not always identify and correct work that did not meet the standards.

(U) According to DON officials, the House Armed Services Committee report, and three reports that we reviewed from the contractors performing the service life extensions, aircraft entering the service life extension process had corrosion that DON maintainers should have identified at the organizational level.[9] Based on reporting by the contractor to the DON and the House Armed Services Committee, the DON took actions to improve the condition of aircraft entering the service life extension programs, including additional training, meetings, coordination, and detailed inspections.

(~~CUI~~) Ensuring that organizational-level inspections and maintenance are performed to DON standards is crucial because the DON spends billions to address corrosion on F/A-18C-G aircraft. Specifically, from FYs 2017 through 2020, the cost to the DON of addressing organizational-level corrosion for F/A-18C-G aircraft was more than $2 billion, and from FYs 2018 through 2020 the DON [redacted] mission capable availability rate goals of [redacted] for F/A-18C/Ds and EA-18Gs and [redacted] for F/A-18E/Fs. Furthermore, corrosion may contribute to aircraft not being mission capable. However, we do not know if corrosion contributed to the mission capability rates and, if so, the extent to which it contributed.

[9] (~~CUI~~) As of April 2021, [redacted] F/A-18C-F aircraft entered a service life extension program, and [redacted] of those [redacted] aircraft completed a service life extension program.

(U) DON Maintainers Completed Most Required 84-Day Inspections

(~~CUI~~) According to DON records, at the organizational (squadron) level, DON maintainers generally reported that they performed required 84-day inspections or had a valid reason for not performing 84-day inspections in FY 2020 for [redacted] ([redacted]) of 151 aircraft in our sample. See Table 2 for a summary of the 84-day inspections by aircraft in FY 2020.

(~~CUI~~) Table 2. Aircraft in Our Sample and Whether Those Aircraft Received Four 84-Day Inspections in FY 2020

(~~CUI~~) Aircraft	Aircraft That Received at Least Four 84-Day Inspections	Aircraft That Received Fewer Than Four 84-Day Inspections With a Valid Reason	Aircraft That Received Fewer Than Four 84-Day Inspections Without a Valid Reason	Aircraft in Our Sample
F/A-18C, Legacy Hornet	[redacted]	[redacted]	[redacted]	32
F/A-18D, Legacy Hornet	[redacted]	[redacted]	[redacted]	16
F/A-18E, Super Hornet	[redacted]	[redacted]	[redacted]	39
F/A-18F, Super Hornet	[redacted]	[redacted]	[redacted]	41
EA-18G, Growler	[redacted]	[redacted]	[redacted]	23
Total	[redacted]	[redacted]	[redacted]	**151** (~~CUI~~)

(U) Source: The DoD OIG.

(~~CUI~~) For the 151 aircraft in our sample, DON maintainers performed [redacted] 84-day inspections in FY 2020.[10] We found that the DON maintainers performed at least four 84-day inspections in FY 2020 for [redacted] of the 151 aircraft in our sample.[11] We projected with a 90-percent confidence level that the number of aircraft in the population of 1,060 F/A-18C-G aircraft that received at least four 84-day inspections is between [redacted] aircraft ([redacted]) and [redacted] aircraft ([redacted]).[12] We also found that the maintainers had a valid reason for not performing at

[10] (~~CUI~~) The total number of 84-day inspections performed for the 151 aircraft in our sample was [redacted] because some aircraft had fewer than four 84-day inspections in FY 2020. If all 151 aircraft had four 84-day inspections in FY 2020, that would be a total of [redacted] inspections.

[11] (~~CUI~~) For one EA-18G aircraft, maintainers performed at least four 84-day inspections, but [redacted] inspections did not appear in DECKPLATE. However, DON officials provided us with other documentation that showed the maintainer performed the inspections on that aircraft.

[12] (U) For more information about the statistical projections, see Appendix B.

(~~CUI~~) least four 84-day inspections in FY 2020 for an additional [redacted] of the 151 aircraft. We projected with a 90-percent confidence level that the number of aircraft in the population of 1,060 F/A-18C-G aircraft that received fewer than four 84-day inspections with a valid reason is between [redacted] aircraft ([redacted]) and [redacted] aircraft ([redacted]). The valid reasons for not performing the 84-day inspections on the [redacted] aircraft included that the maintainers were in quarantine because of the coronavirus disease-2019 or the aircraft were:

- (U) sent to the contractor to enter the service life extension program,
- (U) in depot maintenance or preservation,
- (U) brand new and not yet being used,
- (U) in a long-term down status, or
- (U) stricken from the DON's inventory.

(U) For example, two of the F/A-18E aircraft in our sample were deployed aboard an aircraft carrier and the entire ship was quarantined because of the coronavirus disease-2019. Therefore, the aircraft squadron was unable to perform four 84-day inspections in FY 2020. One of the F/A-18D aircraft in our sample was in depot maintenance during all of FY 2020. Therefore, the aircraft squadron could not perform four 84-day inspections during FY 2020. One of the F/A-18E aircraft in our sample was not placed in service until March 30, 2020. Therefore, that aircraft did not have four 84-day inspections because the aircraft was not in service for all of FY 2020. In another example, one of the EA-18G aircraft in our sample had not flown since May 13, 2020. Therefore, the squadron could not perform four 84-day inspections during FY 2020.

(~~CUI~~) DON maintainers did not perform four 84-day inspections in FY 2020 for the remaining [redacted] of the 151 aircraft in our sample, and DON officials were not able to provide a valid reason for why the required inspections were not performed or why the DON lacked the records to show that the inspections occurred. We projected with a 90-percent confidence level that the number of aircraft in the population of 1,060 F/A-18C-G aircraft that received fewer than four 84-day inspections without a valid reason is between [redacted] aircraft ([redacted]) and [redacted] aircraft ([redacted]). For example, for one F/A-18F aircraft a squadron official stated that a [redacted] 84-day inspection was performed; however, the squadron official was unable to provide documentation to support that the [redacted] 84-day inspection occurred. These [redacted] aircraft were not located within a specific squadron and were spread across the fleet with [redacted] aircraft in [redacted], [redacted] aircraft in [redacted], [redacted] aircraft in [redacted], and the [redacted] aircraft in [redacted] at the time that the inspections were supposed to occur. Therefore, the Commander,

(~~CUI~~) Naval Air Forces, should direct the Strike Fighter Wing Atlantic, Strike Fighter Wing Pacific, and 3rd Marine Air Wing to review the facts and circumstances surrounding the [redacted] aircraft (Bureau Numbers [BUNOs] [redacted]) that did not have four 84-day inspections in FY 2020 to determine whether there is a systemic problem related to not performing the required inspections for these aircraft and develop a solution to mitigate the problem. If no systemic problem exists, then the Commander, Naval Air Forces, should direct Wing officials to develop an internal control to ensure that 84-day inspections occur as required.

(U) 84-Day Inspection Requirements

(~~CUI~~) DON maintainers perform the 84-day inspection at the organizational (squadron) level by completing a series of steps designed to identify corrosion on F/A-18C-G aircraft. The 84-day inspection is tailored for each of the F/A-18C-G aircraft models, depending on the model of aircraft and the type of equipment on that aircraft. Specifically, for the F/A-18 C/D aircraft, there are 19 steps; for the F/A-18 E/F aircraft, there are 32 steps; and for the EA-18G, there are 26 steps. For example, the 84-day inspection includes a step to inspect the [redacted]) for F/A-18C-F models but not the EA-18G model. The EA-18G model does not require this step because it does not have that [redacted] installed on the aircraft. Table 3 shows each step in the 84-day inspection and to which aircraft each step applies.

(~~CUI~~) Table 3. 84-Day Inspection Steps for F/A-18C-G Aircraft

(~~CUI~~) Description	F/A-18C/D	F/A-18E/F	EA-18G
[redacted]		X	X
[redacted]		X	X
[redacted]		X	X
[redacted]	X	X	X
[redacted]		X	X
[redacted]		X	X
[redacted]		X	X
[redacted]	X	X	X
[redacted]		X	X
[redacted]		X	
[redacted]		X	(~~CUI~~)

(~~CUI~~) Table 3. 84-Day Inspection Steps for F/A-18C-G Aircraft (cont'd)

(~~CUI~~) Description	F/A-18C/D	F/A-18E/F	EA-18G
[redacted]		X	X
[redacted]	X	X	X
[redacted]	X	X	X
[redacted]		X	X
[redacted]		X	X
[redacted]		X	X
[redacted]	X	X	X
[redacted]	X	X	X
[redacted]		X	
[redacted]		X	
[redacted]		X	X
[redacted]		X	X
[redacted]	X	X	
[redacted]	X	X	
[redacted]	X	X	
[redacted]		X	X
[redacted]		X	
[redacted]		X	X
[redacted]		X	X
[redacted]	X	X	X
[redacted]		X	X
[redacted]			X
[redacted]			X
[redacted]	X		
[redacted]	X		
[redacted]	X		
[redacted]	X		
[redacted]	X		
[redacted]	X		(~~CUI~~)

(~~CUI~~ Table 3. 84-Day Inspection Steps for F/A-18C-G Aircraft (cont'd)

(~~CUI~~) Description	F/A-18C/D	F/A-18E/F	EA-18G
[redacted]	X		
[redacted]	X		
[redacted]	X		
Total Inspection Steps	**19**	**32**	**26** (~~CUI~~)

* (U) Although these appear to be duplicate 84-day inspection steps, the maintainer skill level required to complete the inspection steps is different; therefore, there are no duplicates.

(U) Source: The DON.

(U) As shown in Table 3, there are specific steps for the 84-day inspections ranging from 19 steps to inspect the Legacy Hornets to 32 steps to inspect the Super Hornet. Each step can include multiple sub-steps and opening various sections of the aircraft. According to DON officials, an 84-day inspection should take 5 days to perform. Because this is a time-consuming and in-depth process designed to mitigate corrosion in aircraft, oversight and quality controls are important. Evidence presented later in this report shows that contractors responsible for performing the service life extensions identified corrosion on aircraft that should have been identified during organizational-level inspections. Since December 2019, the DON has implemented additional training, meetings, coordination, and detailed inspections to improve the condition of aircraft entering the service life extension process.

(U) DON Maintainers Completed Most Maintenance Actions Associated With 84-Day Inspections

(~~CUI~~) According to DON records, at the organizational (squadron) level, maintainers reported that they:

- (~~CUI~~) completed [redacted] maintenance actions associated with the 84-day inspections;
- (~~CUI~~) did not complete [redacted] maintenance actions associated with 84-day inspections but had a valid reason for not completing the actions;
- (~~CUI~~) did not complete [redacted] maintenance actions and did not provide a valid reason for not completing the maintenance actions; and
- (~~CUI~~) did not identify maintenance actions during at least one inspection performed for [redacted] aircraft in our sample.

(U) See Table 4 for a summary of the completed and open maintenance actions associated with the aircraft in our sample as of December 1, 2020.

(~~CUI~~) Table 4. Maintenance Actions as of December 1, 2020, for the Aircraft in Our Sample

(~~CUI~~) Aircraft	Maintenance Actions Completed	Maintenance Actions Not Completed, but With a Valid Reason	Maintenance Actions Not Completed Without a Valid Reason	Total Maintenance Actions
F/A-18C, Legacy Hornet	[redacted]	[redacted]*	[redacted]	[redacted]
F/A-18D, Legacy Hornet	[redacted]	[redacted]	[redacted]	[redacted]
F/A-18E, Super Hornet	[redacted]	[redacted]	[redacted]	[redacted]
F/A-18F, Super Hornet	[redacted]	[redacted]	[redacted]	[redacted]
EA-18G, Growler	[redacted]	[redacted]*	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted] (~~CUI~~)

* (~~CUI~~) DON maintainers had not completed [redacted] F/A-18C and [redacted] EA-18G maintenance actions as of December 1, 2020, but have since completed them.

(U) Source: The DoD OIG.

(~~CUI~~) For the 151 aircraft in our sample, we identified [redacted] maintenance actions associated with the [redacted] 84-day inspections performed in FY 2020. DON maintainers completed a total of [redacted] maintenance actions. DON maintainers did not complete [redacted] maintenance actions on [redacted] aircraft, but had a valid reason for not completing the maintenance actions. The valid reasons for not completing the [redacted] maintenance actions included that the needed part or material was not available to repair the aircraft or the aircraft was in preservation.[13] For example, as of December 1, 2020, maintainers had not completed [redacted] maintenance actions associated with an 84-day inspection performed in September 2020 for one EA-18G aircraft in our sample. According to a DON official, the maintenance actions were not completed because the needed parts or materials were not available to repair the aircraft.

[13] (U) Preservation, coupled with corrosion control, is the method used to slow, defer, or even stop deterioration from corrosion.

(~~CUI~~) DON maintainers did not complete [redacted] maintenance actions for [redacted] aircraft in our sample, and DON officials were not able to provide a valid reason for why the maintenance actions were not completed and why those actions remained open as of December 1, 2020. The following bullets identify two instances in which DON maintainers did not complete maintenance actions and could not provide a valid reason.

- (~~CUI~~) As of December 1, 2020, the DON had not completed [redacted] maintenance action associated with an 84-day inspection on [redacted] F/A-18C aircraft in our sample. According to a DON official, the maintenance action was not complete because the aircraft did not have suitable downtime to complete the maintenance.
- (~~CUI~~) As of December 1, 2020, the DON had not completed [redacted] maintenance actions associated with an 84-day inspection for [redacted] F/A-18F aircraft in our sample. According to a DON official, the maintenance actions were not completed because the squadron only had enough maintainers to work one shift per day and had prioritized other work.

(~~CUI~~) These [redacted] aircraft were not located within a specific squadron and were spread across the fleet at the time the maintenance actions were initiated. These aircraft were located both in and out of the United States and on aircraft carriers. Therefore, the Commander, Naval Air Forces, should direct the Strike Fighter Wing Atlantic, Strike Fighter Wing Pacific, 2nd Marine Air Wing, and 3rd Marine Air Wing to review the facts and circumstances surrounding the [redacted] aircraft (Bureau Numbers [redacted]) that had [redacted] maintenance actions open as of December 1, 2020, to determine whether there is a systemic problem related to the maintenance actions not being completed and closed for these aircraft and develop a solution to mitigate the problem. If no systemic problem exists, then the Commander, Naval Air Forces, should direct Wing officials to develop an internal control to ensure that maintenance actions are completed.

(~~CUI~~) For [redacted] 84-day inspections performed on [redacted] aircraft, DON maintainers did not identify any maintenance actions. The number of maintenance actions identified during an inspection varied dramatically with a high of [redacted] maintenance actions for an inspection of an F/A-18E and a low of [redacted] maintenance action for an inspection of an EA-18G. Because of the age of some of the aircraft in our audit sample and the varying number of maintenance actions per inspection, we asked DON officials to explain why the maintainers did not identify any maintenance actions for [redacted] 84-day inspections performed on [redacted] aircraft. DON officials provided

(~~CUI~~) a valid reason for not identifying any maintenance actions for [redacted] of the [redacted] aircraft that had no maintenance actions identified during at least one of the four 84-day inspections in FY 2020. The valid reasons included that the aircraft:

- (U) had just returned from depot maintenance or the service life extension program,
- (U) was undergoing planned maintenance, or
- (U) did not have corrosion that needed repairs.

(~~CUI~~) For example, one of the F/A-18C aircraft in our sample had [redacted] 84-day inspection in FY 2020 that did not result in any maintenance actions. According to DON officials, the aircraft had just returned from depot maintenance. Therefore, the squadron did not discover any corrosion during the 84-day inspection. One of the F/A-18F aircraft in our sample had [redacted] 84-day inspections in FY 2020 that did not result in any maintenance actions. According to DON officials, the aircraft was located in a dry, low-humidity environment that is less susceptible to corrosion. Therefore, it did not have corrosion that needed repairs. One of the EA-18G aircraft in our sample had [redacted] 84-day inspection in FY 2020 that did not result in any maintenance actions. According to DON officials, the aircraft was undergoing planned maintenance.

(~~CUI~~) For [redacted] of the [redacted] aircraft that did not have any maintenance actions identified during the four 84-day inspections, DON officials were not able to provide a reason for not identifying any maintenance actions. A lack of identified maintenance actions could be a problem if the reason for not identifying the maintenance actions was because the maintainer did not perform the inspection to DON standards. Later in the report, we discuss actions the DON has taken to address corrosion not identified or corrected as part of organizational-level maintenance and we make a recommendation in that section. Therefore, we will not make a recommendation to the DON for these [redacted] aircraft that did not have identified maintenance actions.

(U) The quality of maintenance actions performed to address corrosion is important because if maintainers do not complete the maintenance actions to DON standards, the actions may need to be redone or the repair may fail. Evidence presented later in this report shows that contractors responsible for performing the service life extensions identified corrosion on aircraft that should have been identified during organizational level inspections and repaired through maintenance actions. Since December 2019, the DON has implemented additional training, meetings, coordination, and detailed inspections to improve the condition of aircraft entering the service life extension process.

(U) The DON Implemented Technical Directives to Address Corrosion

(U) The DON implemented 14 organizational-level technical directives to address corrosion on required F/A-18C-G aircraft and component parts. From 1989 through 2020, the DON implemented 14 technical directives at the organizational level for specific aircraft or component parts of aircraft to prevent and correct corrosion. Of the 14 technical directives that we reviewed, 5 technical directives were rescinded or due to be completed by December 31, 2017. The DON implemented those five technical directives on all of the required aircraft or component parts of aircraft with the exception of one aircraft that had a valid reason for not implementing one of the five technical directives. Table 5 describes the purpose of each of the 14 technical directives, the date the DON issued the directive, the type of aircraft impacted by the directive, and the date the directive was rescinded or due to be completed.

~~(CUI)~~ Table 5. Organizational-Level Maintenance Technical Directives Related to Corrosion

~~(CUI)~~ Technical Directive	Issuance Date	Purpose	Affected Aircraft Models	Rescission or Completion Date
AFB 180	3/31/1989	[redacted]	C/D	6/30/1990[1]
AFB 193	2/7/1990	[redacted]	C/D	12/31/1991[1]
AFB 228	12/21/1990	[redacted][2]	C	12/31/1993[1]
AFB 803	4/18/2016	[redacted]	G	12/31/2017
AFB 854	12/12/2019	[redacted]	E-G	6/30/2024 ~~(CUI)~~

(~~CUI~~) Table 5. Organizational-Level Maintenance Technical Directives Related to Corrosion (cont'd)

(~~CUI~~) Technical Directive	Issuance Date	Purpose	Affected Aircraft Models	Rescission or Completion Date
AFC 496	11/3/2008	[redacted]	C/D	6/30/2025
AFC 497	11/3/2008	[redacted]	C/D	6/30/2024
AFC 498	7/7/2009	[redacted]	C/D	12/31/2021
AFC 543 Part 2	3/24/2017	[redacted]	C/D	12/31/2023
AEB 12	5/5/2020	[redacted]	E-G	6/30/2022 **(~~CUI~~)**

(~~CUI~~) Table 5. Organizational-Level Maintenance Technical Directives Related to Corrosion (cont'd)

(~~CUI~~) Technical Directive	Issuance Date	Purpose	Affected Aircraft Models	Rescission or Completion Date
AYB 798	12/22/2003	[redacted]	C/D Parts	6/30/2011
AYB 1037	5/19/2014	[redacted]	E/F Parts	12/31/2024
AYC 1394	2/17/2010	[redacted]	E/F Parts	12/31/2024
AYC 1517	4/24/2013	[redacted]	E-G Parts	6/30/2021 ~~(CUI)~~

[1] (U) Indicates the rescission date of the technical directive.

[2] (U) A dorsal longeron is a longitudinal structural component located on the top of the aircraft.

(U) Source: The DoD OIG.

(U) As Table 5 shows, the oldest technical directives were issued in 1989 and 1990 and rescinded by the end of 1991. Newer technical directives were issued in 2019 and 2020 and are not due to be completed until 2024. We reviewed records from DECKPLATE and compared those to the specific aircraft or component parts identified in the technical directive to validate whether the DON implemented the technical directives on the required aircraft and component parts.

(U) Of the 14 technical directives to prevent and correct corrosion, 10 directives applied to specific aircraft and 4 directives were accessory technical directives, meaning that those 4 directives applied to a component part on an aircraft. Table 6 shows the 10 technical directives that applied to specific aircraft, the type and total number of aircraft that the technical directives applied to, the number of those aircraft that had the technical directive implemented, and how many of those aircraft were stricken (removed from inventory).

(~~CUI~~) Table 6. Organizational-Level Maintenance Technical Directives Implemented on Required F/A-18C-G Aircraft

(~~CUI~~) Technical Directive	Rescission or Completion Date	Affected Aircraft Models	Number Affected Aircraft	Number of Aircraft With Technical Directive Implemented	Aircraft With Technical Directive Not Implemented That Are Stricken	Percentage Implemented on Non-Stricken Aircraft
AFB 180[3]	6/30/1990[1]	C/D	[redacted]	[redacted]	[redacted]	100
AFB 193[3]	12/31/1991[1]	C/D	[redacted]	[redacted]	[redacted]	100
AFB 228[4]	12/31/1993[1]	C	[redacted]	[redacted]	[redacted]	100
AFB 803[3]	12/31/2017	G	[redacted]	[redacted]	[redacted]	99.1
AFB 854[3]	6/30/2024	E-G	[redacted]	[redacted]	[redacted]	90.6
AFC 496[3]	6/30/2025	C/D	[redacted]	[redacted]	[redacted]	96.9
AFC 497[3]	6/30/2024	C/D	[redacted]	[redacted]	[redacted]	98.2
AFC 498[3]	12/31/2021	C/D	[redacted]	[redacted]	[redacted]	98.2
AFC 543 Part 2[4]	12/31/2023	C/D	[redacted]	[redacted]	[redacted]	73.8
AEB 12[5]	6/30/2022	E-G	[redacted]	[redacted]	[redacted]	6.5 (~~CUI~~)

[1] (U) Indicates the rescission date of the technical directive.

[2] (~~CUI~~) There were [redacted] aircraft that were stricken from the inventory and missing from the implementation report; therefore, we were unable to determine whether DON personnel implemented AFC 543 Part 2 on those [redacted] aircraft.

[3] (U) Data as of March 2021.

[4] (U) Data as of April 2021.

[5] (U) Data as of June 2021.

(U) Source: The DoD OIG.

(U) As Table 6 shows, the DON implemented four technical directives (AFB 180, AFB 193, AFB 228, and AFB 803) on nearly all required aircraft. The DON did not implement AFB 803 on just one aircraft. A Fleet Readiness Center Southwest official stated that one aircraft has not complied with the technical directive because the aircraft experienced an engine fire and was in depot storage pending funding for repairs.

(~~CUI~~) For the six remaining technical directives that applied to specific aircraft, the DON had not completed the implementation as of March 2021, but the DON was also not required to do so. These six technical directives have required completion dates in the future, with the latest completion date in June 2025. For example, Table 6 shows that, as of June 2021, the DON implemented AEB 12 on [redacted] of the [redacted] required aircraft. However, the target completion date for AEB 12 is June 30, 2022. As a result, the DON still has time to implement AEB 12 on the

(~~CUI~~) remaining aircraft. According to DON officials, the DON was on track to implement the remaining six technical directives on affected aircraft by the required completion date.

(U) A Fleet Readiness Center Southwest official stated that the DON tracks implementation of accessory technical directives differently because they are component-related technical directives as opposed to overall aircraft-related technical directives. Table 7 shows the total number of component parts affected by each of the four accessory technical directives, and how many of those component parts had the technical directive implemented.

(~~CUI~~) Table 7. Organizational-Level Maintenance Accessory Technical Directives Implemented on Component Parts of F/A-18C-G Aircraft

(~~CUI~~) Technical Directive	Completion Due Date	Affected Aircraft Component Parts	Number of Affected Component Parts	Number of Component Parts With Technical Directives Implemented	Percentage Implemented
AYB 798[1]	6/30/2011	C/D	[redacted]	[redacted]	100
AYB 1037[2]	12/31/2024	E/F	[redacted]	[redacted]	75.4
AYC 1394[2]	12/31/2024	E/F	[redacted]	[redacted]	80.2
AYC 1517[2]	6/30/2021	E-G	[redacted]	[redacted]	85.1 (~~CUI~~)

[1] (U) Data as of March 2021.

[2] (U) Data as of April 2021.

(U) Source: The DoD OIG.

(U) As Table 7 shows, the DON implemented accessory technical directive AYB 798 on all required component parts. For the three remaining accessory technical directives, the DON did not complete the implementation, but the latest due date was not until December 31, 2024. As of March 2021, the DON still had time to implement AYB 1037, AYC 1394, and AYC 1517 on the remaining component parts.

(U) The DON Took Additional Actions to Address Corrosion

(~~CUI~~) In addition to performing required inspections and maintenance and implementing technical directives designed to prevent and correct corrosion, the DON conducted supplementary training and implemented procedures to perform before aircraft entered a service life extension program. The DON took these actions, in part, because of statements by contractors that aircraft entering the service life extension programs had corrosion that should have been identified

(~~CUI~~) at the organizational level.[14] As of May 2021, the DON had three contracts for service life extension and other maintenance and repair work of Legacy and Super Hornets with a combined total base and all options value of about $948.2 million.[15] For [redacted] aircraft in our sample ([redacted] Legacy Hornets and [redacted] Super Hornets), a PMA-265 official told us that the DON had spent more than $20.5 million on service life extension programs.

(U) According to the House Armed Services Committee report that accompanied the National Defense Authorization Act for FY 2021, Boeing, the original manufacturer of Legacy Hornets and Super Hornets, identified corrosion-related maintenance problems with F/A-18 aircraft during the service life extension programs that the DON should have identified and corrected during organizational-level maintenance. In addition, DON officials also stated that there was corrosion identified during the service life extension process that should have been identified and corrected during organizational-level inspections and maintenance.

(U) Because our analysis of 84-day inspections, associated maintenance actions, and 14 technical directives showed that the DON generally performed and implemented them on F/A-18C-G aircraft, we tried to identify why the contractor stated that it found corrosion that should have been previously identified. We also wanted to identify documentation or other evidence that corroborated the statements in the House Armed Services Committee report and statements made by DON officials.

(U) We reviewed examples of the reports the contractor provided during and after the service life extension process. Specifically, we reviewed the contractor's report after extending the service life of an F/A-18D by 1,000 hours.[16] The report stated that the contractor performed corrosion damage repair; however, a Commander, Naval Air Forces Atlantic official stated that the corrosion damage repair made by the contractor was not a repair that should have been resolved by organizational-level maintainers. We also reviewed three reports the contractor provided 90 days after an F/A-18E and two F/A-18Fs were inducted for service life modification.[17] These three aircraft were in our audit sample. The 90-day reports, called material condition reports, identified areas of organizational-level corrosion on the three aircraft that should have been addressed before induction into service life modification program. PMA-265 officials identified corrosion-related items in the material condition reports that should have been addressed at the organizational

[14] (~~CUI~~) As of April 2021, [redacted] F/A-18C-F aircraft in the active inventory entered a service life extension program, and [redacted] of those [redacted] aircraft completed a service life extension program.

[15] (U) Contracts N00019-14-D-0001, N00019-16-D-1003, and N00019-18-D-0001.

[16] (~~CUI~~) The BUNO for this F/A-18D is [redacted]

[17] (~~CUI~~) The BUNO for the F/A-18E is [redacted] The BUNOs for the F/A-18Fs are [redacted] and [redacted]

(U) level; however, the officials stated that not all of the conditions were exclusive to 84-day inspections. For example, the F/A-18E was inducted into the service life modification program on January 31, 2020, and PMA-265 officials indicated that the corrosion found on some of the doors should have been addressed at the organizational level before it was inducted into the program. In addition, the contractor stated that there were multiple areas of corrosion on the canopy, and one of the steps of an 84-day inspection is to check the canopy for corrosion. In another example, one of the F/A-18Fs was inducted into the service life modification program on November 23, 2020, and the contractor stated that there was corrosion on the canopy.[18] Therefore, three of the four reports we reviewed corroborated statements that corrosion identified during a service life extension program should have been identified during organizational-level maintenance. See Figure 4 for the corrosion found by the contractor on the canopy of an F/A-18F during service life modification.

(CUI)
(U) Source: Commander, Strike Fighter Wing Atlantic.

(U) Based on our analysis, we concluded that maintainers did not always perform the organizational-level inspections or maintenance to DON standards and officials responsible for oversight did not always identify and correct work that did not meet the standards or was not conducted. The NAMP requires the official designated as "maintenance control" to ultimately review, approve, or reject

[18] (~~CUI~~) The BUNO in this example is

(U) inspections and maintenance actions within the Naval Aviation Logistics Command Management Information System Optimized Organizational Maintenance Activity, more commonly known by its acronym NALCOMIS OOMA. Therefore, even if maintainers did not do the work correctly, the maintenance control official should have detected and corrected the work.

(U) The following sections of this report outline the Commander, Naval Air Forces initiatives to improve the condition of aircraft entering service life extension programs and other DON initiatives to train and improve quality controls over inspections and maintenance actions. The DON needs to continue these efforts, and then assess whether the amount of organizational-level corrosion problems found in aircraft after induction for service life extension is improving. Therefore, the Commander, Naval Air Forces, should assess the actions implemented to address corrosion and determine whether these actions resulted in fewer instances of corrosion that should have been identified at the organizational level during the service life extension process, reduced costs associated with corrosion prevention or correction, or improved readiness measured in either operational availability or mission capability. If the actions have not reduced the number of instances of corrosion that should have been identified at the organizational level, reduced costs, or improved readiness, then the Commander should identify alternate initiatives to address organizational-level corrosion inspection and maintenance.

(U) Commander, Naval Air Forces Message About F/A-18E/F Aircraft and the Service Life Modification Program

(U) After contractors performing service life extensions on F/A-18 aircraft reported that aircraft entering the program had corrosion that DON maintainers should have identified at the organizational level, Commander, Naval Air Forces, issued a message to put in place additional quality control steps. The December 17, 2019 message from Commander, Naval Air Forces, about F/A-18E/F aircraft stated:

> (U) Thirteen aircraft have already been inducted into this process [the service life extension process] with troubling material condition findings. A large portion of the issues being discovered are in o-level [organizational-level] access areas that should be discovered and corrected during routine squadron inspections. The extensively degraded material condition is causing thousands of hours of additional work at an unsustainable cost. SLM [service life modification] funding must be used for its original purpose, which is to upgrade and extend the life of the SH [Super Hornets], not to repair material condition discrepancies that we should be finding and fixing ourselves.[19]

[19] (U) Commander, Naval Air Forces message "F/A-18E/F SLM Inductions," December 17, 2019.

(U) While the Commander's message does not specifically identify corrosion as the "extensively degraded material condition," the message does direct DON officials to open all access doors during the 84-day inspection to detect corrosion and repair any substructure or fastener hole corrosion problems. The Commander's message also required officials to:

- (U) hold teleconferences with the wing, carrier air group, and aircraft custodian 6 months, 3 months, and 1 month before Super Hornets enter the service life modification program;
- (U) conduct joint 84-day inspections with the squadron, fleet support team, and Naval Air Technical Data and Engineering Service Command site representatives; and
- (U) conduct on-aircraft opening, inspection, and closure training in accordance with the door removal and installation procedures.

(U) We collected documentation that showed the DON has started to implement the Commander's instructions from the December 2019 message. PMA-265 provided documentation showing that there were quarterly teleconferences between the Program Executive Office, PMA-265, and Boeing officials to assess the overall pre-service life modification program, identify obstacles, and discuss possible solutions. The March 2020 teleconference agenda identified the responsible parties for specific initiatives, actions taken, and the overall status of the program.

(U) PMA-265 provided documentation showing that as of June 2020, the DON was performing joint 84-day inspections. A Fleet Readiness Center Southwest presentation outlined requirements for inspecting F/A-18E/F aircraft scheduled for induction.[20] These requirements included two joint 84-day inspections scheduled for completion before the aircraft was inducted for service life modification and for all access doors to be opened during scheduled inspections. The presentation also analyzed pre-service life modification inspections to assess the material condition, form-in-place seal, and application of a corrosion-prevention compound. The presentation included inspection reports for 16 F/A-18E/Fs that assigned each aircraft a material condition grade and identified the total number of discrepancies. PMA-265 also provided an example of a pre-service life modification inspection report used for a joint 84-day inspection. This report detailed the BUNO, the material condition, form-in-place seal, corrosion prevention compound, and the total number of discrepancies.

[20] (U) "F/A-18 Fleet Support Team Structures," June 2020.

(U) Finally, a Commander, Strike Fighter Wing Atlantic official stated that Naval Air Technical Data and Engineering Service Command personnel provide training to squadron officials during maintenance reset. In addition, a PMA-265 official provided several training videos on door inspections and removal and on form-in-place seals as well as presentations on how to apply form-in-place seals on F/A-18C-G aircraft. Therefore, DON officials had started to implement the requirements of the Commander's December 2019 message.

(U) Maintenance Reset and Maintenance Optimization

(~~CUI~~) A PMA-265 official stated that the DON is conducting a maintenance reset as part of the AEB 12 technical directive applicable to [redacted] F/A-18E-G aircraft. This maintenance reset includes performing special inspections to clean, treat, and repair corroded areas if needed. A Commander, Strike Fighter Wing Atlantic official stated that the maintenance reset process provided on-the-job training to maintainers, such as how to properly apply a form-in-place seal and how to identify signs of corrosion. The training also taught maintainers the importance of documenting everything they identify during an inspection even if it was something that maintainers could not fix right away. In addition, a Commander, Strike Fighter Wing Atlantic official and PMA-265 official stated that during the maintenance reset process, Naval Air Technical Data and Engineering Service Command personnel provided maintenance training to the squadrons and showed the maintainers how to identify and treat corrosion. A PMA-265 official stated that the lessons learned during the maintenance reset process were shared across Strike Fighter Wing Atlantic, Strike Fighter Wing Pacific, and Electronic Attack Wing Pacific. According to a PMA-265 official, from August 2019 to July 2020, the DON completed a maintenance optimization reliability centered maintenance review of F/A-18E/F and EA-18G scheduled maintenance tasks and inspection intervals that changed the 84-day inspection interval to 91 days. A PMA-265 official clarified that the inspection interval change was released in December 2020 and affected only F/A-18E/Fs and EA-18Gs. Therefore, the inspection interval for F/A-18C/Ds remained 84 days. The PMA-265 official stated that the updated inspection interval would enable the fleet to perform maintenance at the most appropriate interval, which will result in improved material condition.

(U) Organizational-Level Training for Maintainers

(U) The DON trained maintainers at the squadron level to improve the quality of organizational-level inspections and maintenance. For example, the Corrosion Action Team developed training videos that walked maintainers through the steps to remove parts of an aircraft, check for corrosion, treat areas where corrosion is found, and re-install the part that was removed, such as wings, doors, hinges,

(U) and fasteners. The Corrosion Action Team also developed wall charts, posters, and demonstrations to support maintainers in addressing corrosion. For example, the Corrosion Action Team visited:

- (~~CUI~~) [redacted] F/A-18A-D squadron at Marine Corps Air Station Iwakuni, Japan, from January 20 through 21, 2016;
- (~~CUI~~) [redacted] EA-18G squadrons at Naval Air Station Whidbey Island, Washington, from September 26 through 28, 2017;
- (~~CUI~~) [redacted] F/A-18E/F squadrons at Naval Air Station Oceana, Virginia, from April 16 through 18, 2019; and
- (~~CUI~~) [redacted] F/A-18E/F squadrons at Naval Air Station Lemoore, California, from June 25 through 27, 2019.

(U) The objective of the site visits included reviewing corrosion-prone areas on the aircraft at each location, providing hands-on corrosion prevention demonstrations to maintainers, and gathering information on problems the squadrons at each location were experiencing with corrosion. In addition, a PMA-265 official stated that the last site visit by the Corrosion Action Team was to Naval Air Station Whidbey Island in February 2020. The PMA-265 official stated that the Corrosion Action Team changed its focus to support the maintenance reset and maintenance optimization efforts. Lastly, the PMA-265 official stated that during maintenance reset, Naval Air Technical Data and Engineering Service Command personnel and subject matter experts trained maintainers on identifying and treating corrosion.

(U) In another example of training, a Marine Aviation Logistics 11 squadron official stated that an F/A-18 corrosion specialist from the Naval Air Technical Data and Engineering Service Command provided training to Marine Corps squadrons and performed walkthroughs when squadron maintainers performed 84-day inspections on F/A-18C/Ds to assess the quality of the inspections.

(U) In addition, the DON partnered with Boeing to implement a 5-week training course with twice daily first-time quality reviews with operations and quality on-the-job training with experienced subject matter expert coaches for F/A-18E/F aircraft.

(U) In FYs 2019 and 2020, the DON has initiated teleconferences, joint inspections, maintenance reset and optimization practices, and training, designed to reduce the costs and level of maintenance associated with the service life extension process. The DON has not yet assessed the effectiveness of these actions.

(~~CUI~~) The DON Spent More Than $2 Billion to Address Corrosion on F/A-18C-G Aircraft and [redacted]

(~~CUI~~) Ensuring that organizational-level inspections and maintenance are performed to DON standards is crucial because the DON spends billions to address corrosion on F/A-18C-G aircraft. Furthermore, corrosion may directly contribute to aircraft not being mission capable. Specifically, from FYs 2017 through 2020, the cost to the DON of addressing organizational-level corrosion for F/A-18C-G aircraft was more than $2 billion, and those aircraft [redacted] mission capable availability rate goals from FYs 2018 through 2020. Table 8 shows the total maintenance cost and total corrosion maintenance cost for F/A-18C-G aircraft for FYs 2017 through 2020.

(U) Table 8. Total Maintenance Cost and Total Corrosion Maintenance Costs for F/A-18C-G Aircraft for FYs 2017 Through 2020

Aircraft	Total Maintenance Cost	Total Corrosion Maintenance Cost	Corrosion Cost as a Percent of Total Maintenance Cost
F/A-18C	$1,400,371,978	$401,946,075	28.7
F/A-18D	689,559,684	193,295,186	28.0
F/A-18E	2,036,194,455	635,789,109	31.2
F/A-18F	1,844,288,828	537,255,396	29.1
EA-18G	1,130,446,583	318,510,787	28.2
Total	**$7,100,861,528**	**$2,086,796,553**	**29.4**

(U) Source: Maintenance and Availability Data Warehouse.

(~~CUI~~) As Table 8 shows, maintenance costs associated with corrosion were nearly 30 percent of all maintenance costs for F/A-18C-G aircraft from FYs 2017 through 2020. However, it is important to note that the F/A-18C/D aircraft have been flown more than originally intended. As of April 2021, the [redacted] F/A-18C/Ds in the active inventory that entered the service life extension program had [redacted] average flight hours. The [redacted] F/A-18E/Fs that entered the service life modification program had [redacted] average flight hours. Legacy and Super Hornets were originally designed for 6,000 hours. With service life extensions and aircraft being rotated in and out of areas where corrosion is prevalent—saltwater and sandy environments—a certain amount of corrosion is expected.

(~~CUI~~) From FYs 2018 through 2020, F/A-18C-G aircraft [redacted] mission capable availability rate goals of [redacted] for F/A-18C/Ds and EA-18Gs and [redacted] for F/A-18E/Fs. The impact to readiness measured by average percent

(~~CUI~~) available mission capable was [redacted] for F/A-18C-Fs and EA-18Gs. Table 9 shows the average mission capability rates for each aircraft for FYs 2018 through 2020.

(~~CUI~~) Table 9. Average Percent Available Mission Capability Rates for F/A-18C-G Aircraft for FYs 2018 Through 2020

(~~CUI~~) Aircraft	Average Mission Capable Availability Rate FY 2018* (Percent)	Average Mission Capable Availability Rate FY 2019 (Percent)	Average Mission Capable Availability Rate FY 2020 (Percent)	Target Mission Capable Rate (Percent)
F/A-18C	[redacted]	[redacted]	[redacted]	[redacted]
F/A-18D	[redacted]	[redacted]	[redacted]	[redacted]
F/A-18E	[redacted]	[redacted]	[redacted]	[redacted]
F/A-18F	[redacted]	[redacted]	[redacted]	[redacted]
EA-18G	[redacted]	[redacted]	[redacted]	[redacted] (~~CUI~~)

* (~~CUI~~) [redacted]

(U) Source: Maintenance and Availability Data Warehouse.

(~~CUI~~) As shown in Table, 9, the average mission capability rate for F/A-18C-G aircraft ranged from about [redacted] to [redacted] from FYs 2018 through 2020. These rates are [redacted] We do not know if corrosion contributed to the mission capability rates and, if so, the extent to which it contributed.

(U) Conclusion

(U) Contractors that perform service life extensions for F/A-18 aircraft and DON officials stated that some of the corrosion found during the service life extension process should have been identified and corrected at the organizational level. We reviewed three contractor reports that showed corrosion that should have been identified during organizational-level maintenance. In response to reporting by the contractor, the DON implemented procedures, training, and other initiatives to improve the condition of aircraft entering the service life extension programs. Because our analysis showed that the DON generally performed corrosion-related inspections and maintenance at the organizational level, including implementing technical directives, we concluded that maintainers did not always perform the organizational-level inspections or maintenance to DON standards, and officials responsible for oversight did not always identify and correct work that did not meet the standards. When inspections and maintenance on aircraft do not meet DON standards, the work may need to be redone or the repair may fail. The cost

(U) of maintenance related to corrosion for the DON was significant, at $2 billion from FYs 2017 through 2020. Therefore, continued evaluation of initiatives and course correction are vital to keeping costs down and improving mission capability rates for F/A-18C-G aircraft.

(U) Management Comments on the Finding and Our Response

(U) PMA-265 Program Manager Comments on the Audit Scope and Finding

(U) Although not required to comment, the PMA-265 Program Manager provided comments on the finding that were endorsed by the NAVAIR Chief Engineer. The Program Manager stated that the sampling methods used to draw statistical conclusions were incomplete, the audit did not take advantage of all data provided by the DON, and the scope was too narrowly defined to create a complete view of the issues.

(~~CUI~~) The Program Manager stated [redacted]

(~~CUI~~) The Program Manager stated that the strict interpretation of the House Armed Services Committee report to review organizational factors of corrosion prevented the DoD OIG from determining root causes. The Program Manager stated that three factors contribute to corrosion on F/A-18 aircraft, the environment, design, and maintenance at the organizational, intermediate, and depot levels. The focus on organizational-level maintenance limited the audit and did not look into other factors affecting corrosion on the aircraft, such as the operating environment, aircraft design, design changes, and training. The Program Manager added that by correcting the organizational-level findings, the reader could assume that all corrosion in F/A-18 aircraft will be eliminated.

(~~CUI~~) The Program Manager also stated that other ongoing initiatives to address F/A-18 corrosion include the [redacted]

(U) Our Response

(U) We disagree with the PMA-265 Program Manager's comments on the report's scope and finding. This audit was performed in response to a reporting requirement for the DoD Office of Inspector General contained in the House Armed Services Committee report that accompanied the National Defense Authorization Act for FY 2021. Specifically, the Committee directed us to review whether DON maintainers performed organizational-level maintenance to address corrosion in F/A-18C-G aircraft. Therefore, we did not review the design of F/A-18 aircraft or every level of maintenance, including intermediate and depot-level maintenance, to address corrosion. The Navy can and should assess areas related to the F/A-18 aircraft and does not have to wait for the DoD Office of Inspector General to perform an audit on it. Furthermore, we acknowledge that corrosion cannot entirely be eliminated, and we inform the reader on the environmental factors and effects of corrosion on aircraft in the report. The DON should work with the Office of the Assistant Secretary of Defense for Sustainment to confirm and ensure that the MADW site is calculating mission capability rates or percentages in accordance with the NAMP.

(U) Recommendations, Management Comments, and Our Response

(U) Recommendation 1

(~~CUI~~) We recommend that the Commander, Naval Air Forces, direct the Strike Fighter Wing Atlantic, Strike Fighter Wing Pacific, and 3rd Marine Air Wing to review the facts and circumstances surrounding the [redacted] aircraft (Bureau Numbers [redacted]) that did not have four 84-day inspections in FY 2020 to determine whether there is a systemic problem related to not performing the required inspections for these aircraft and develop a solution to mitigate the problem. If no systemic problem exists, then the Commander, Naval Air Forces, should direct Wing officials to develop an internal control to ensure that 84-day inspections occur as required.

(U) Commander, Naval Air Forces Comments

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(U) Our Response

(~~CUI~~) Although the Deputy Assistant Chief of Staff did not agree or disagree, his comments partially addressed the recommendation. Therefore, the recommendation is resolved, but will remain open until the Commander, Naval Air Forces, provides additional documentation. Based on the supporting documentation provided, we agree that [redacted] of the [redacted] aircraft (BUNOs [redacted]) had received four 84-day inspections in FY 2020 or had a valid reason for not receiving four inspections. However, the Commander, Naval Air Forces, did not provide documentation that showed that the DON completed four 84-day inspections for [redacted] of the aircraft (BUNOs [redacted]). Because the officials determined that the 84-day inspections occurred, there was no need for the DON to develop an internal control to address the lack of 84-day inspections at the Wing level. We request that the Commander, Naval Air Forces, provide maintenance records so we can verify that the remaining [redacted] aircraft (BUNOs [redacted]) received four 84-day inspections in FY 2020. Once we verify the maintenance records, we will close this recommendation.

(U) Recommendation 2

(~~CUI~~) We recommend that the Commander, Naval Air Forces, direct the Strike Fighter Wing Atlantic, Strike Fighter Wing Pacific, 2nd Marine Air Wing, and 3rd Marine Air Wing to review the facts and circumstances surrounding the [redacted] aircraft (Bureau Numbers [redacted]) that had [redacted] maintenance actions open as of December 1, 2020, to determine whether there is a systemic problem related to maintenance actions not being completed and closed for these aircraft and develop a solution to mitigate the problem. If no systemic problem exists, then the Commander, Naval Air Forces, should direct Wing officials to develop an internal control to ensure that maintenance actions are completed.

(U) Commander, Naval Air Forces Comments

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(~~CUI~~) Documentation provided by Deputy Assistant Chief of Staff showed that [redacted] of the [redacted] maintenance actions were closed between the date of our analysis (December 1, 2020) and the issuance of our discussion draft. [redacted]

(U) Our Response

(~~CUI~~) Although the Deputy Assistant Chief of Staff did not agree or disagree, his comments partially addressed the recommendation. Therefore, the recommendation is resolved, but will remain open until the Commander, Naval Air Forces, provides additional documentation. While we understand that the maintenance system's replication issues caused the discrepancies, we provided the squadrons with open maintenance actions the opportunity to provide additional documentation or an explanation. None of the squadrons provided documentation to show that the maintenance actions had been closed in June 2020. We agree that [redacted] of the [redacted] maintenance actions have been closed. However, there is [redacted] aircraft ([redacted]) with [redacted] maintenance actions that have not been closed as of August 2021. Because the officials determined that [redacted] of [redacted] maintenance actions were completed and we have requested additional documentation from the DON for the [redacted] remaining maintenance actions, there was no need for the DON to develop an internal control to address the maintenance actions that had not been closed at the Wing level. We request that the Commander, Naval Air Forces, provide maintenance records so we can verify that these [redacted] maintenance actions have been closed. Once we verify the maintenance records, we will close this recommendation.

(U) Recommendation 3

(U) We recommend that the Commander, Naval Air Forces, assess the actions implemented to address corrosion and determine whether these actions resulted in:

- **(U) fewer instances of corrosion that should have been identified at the organizational level during the service life extension process,**

- **(U) reduced costs associated with corrosion prevention or correction, or**
- **(U) improved readiness measured in either operational availability or mission capability.**

(U) If the actions have not reduced the number of instances of corrosion that should have been identified at the organizational level, reduced costs, or improved readiness, then the Commander should identify alternate initiatives to address organizational-level corrosion inspection and maintenance.

(U) Commander, Naval Air Forces Comments

(~~CUI~~) The Deputy Assistant Chief of Staff, Aviation Maintenance and Material Readiness, responding for the Commander, Naval Air Forces, did not agree or disagree with the recommendation. [redacted]

(U) Our Response

(U) Comments from the Deputy Assistant Chief of Staff did not address the intent of this recommendation; therefore, the recommendation is unresolved. We acknowledge that the DON implemented actions to address corrosion; however, the Deputy Assistant Chief of Staff did not state whether these actions have been assessed for effectiveness. To resolve this recommendation, we request that the Commander, Naval Air Forces, provide additional comments that explain how and when the DON will measure the effectiveness of the implemented actions taken to address corrosion and determine whether these actions resulted in fewer instances of corrosion, reduced costs, or improved readiness. If the Commander, Naval Air Forces, plans to use metrics other than those we specifically identified to measure success, we ask that the Commander describe those metrics. Once the DON has completed the assessment, we ask that the Commander, Naval Air Forces, provide us with a copy of the results.

(U) Appendix A

(U) Scope and Methodology

(U) We conducted this performance audit from October 2020 through July 2021 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) Audit Universe and Sample Selection

(U) PMA-265 provided us with an inventory of all F/A-18C-G aircraft. According to PMA-265, as of September 23, 2020, the DON had an inventory of 1,060 F/A-18C-G aircraft. From a total universe of 1,060 F/A-18C-G aircraft, we worked with the Quantitative Methods Division to identify a statistical sample of 151 F/A-18C-G aircraft, based on aircraft type, model, and series. Table 10 shows the number of aircraft we reviewed based on aircraft type, model, and series.

(U) Table 10. Breakdown of DON F/A-18C-G Aircraft Universe and Sample Size

Aircraft	Universe Size	Sample Size
F/A-18C, Legacy Hornet	235	32
F/A-18D, Legacy Hornet	100	16
F/A-18E, Super Hornet	306	39
F/A-18F, Super Hornet	257	41
EA-18G, Growler	162	23
Total	**1,060**	**151**

(U) Source: The DoD OIG.

(U) Our statistical sample of 151 F/A-18C-G aircraft included 141 aircraft that belonged to 55 squadrons, and 10 aircraft that belonged to 3 other DON organizations. Table 11 shows the 141 aircraft we reviewed by squadron and location. Table 12 shows the remaining 10 aircraft we reviewed by organization and location.

(U) Table 11. Breakdown of 141 Aircraft by Squadron and Location

Squadron	Location	Number of Aircraft in Sample
Marine Aircraft Group-11 Aircraft Detachment	Marine Corps Air Station(MCAS) Miramar, California	8
Marine Aircraft Group-31 Aircraft Detachment	MCAS Beaufort, South Carolina	7
Navy Flight Demonstration Squadron	Naval Air Station (NAS) Pensacola, Florida	2
Electronic Attack Squadron (VAQ)-129	NAS Whidbey Island, Washington	8
VAQ-134	NAS Whidbey Island	2
VAQ-136	NAS Whidbey Island	1
VAQ-137	NAS Whidbey Island	1
VAQ-140	NAS Whidbey Island	1
VAQ-141	MCAS Iwakuni, Japan	1
VAQ-142	NAS Whidbey Island	2
VAQ-209	NAS Whidbey Island	1
Strike Fighter Squadron (VFA)-102	MCAS Iwakuni	2
VFA-103	NAS Oceana, Virginia	3
VFA-105	NAS Oceana	3
VFA-106	NAS Oceana	10
VFA-11	NAS Oceana	1
VFA-113	NAS Lemoore, California	2
VFA-122	NAS Lemoore	5
VFA-131	NAS Oceana	3
VFA-136	NAS Lemoore	2
VFA-137	NAS Lemoore	3
VFA-14	NAS Lemoore	1
VFA-143	NAS Oceana	2
VFA-146	NAS Lemoore	1
VFA-151	NAS Lemoore	1
VFA-154	NAS Lemoore	2
VFA-192	NAS Lemoore	2
VFA-2	NAS Lemoore	1
VFA-204	NAS Joint Reserve Base New Orleans, Louisiana	5

(U) Table 11. Breakdown of 141 Aircraft by Squadron and Location (cont'd)

Squadron	Location	Number of Aircraft in Sample
VFA-213	NAS Oceana	1
VFA-22	NAS Lemoore	3
VFA-27	MCAS Iwakuni	1
VFA-31	NAS Oceana	3
VFA-32	NAS Oceana	3
VFA-34	NAS Oceana	2
VFA-41	NAS Lemoore	1
VFA-81	NAS Oceana	2
VFA-83	NAS Oceana	2
VFA-86	NAS Lemoore	1
VFA-87	NAS Oceana	2
VFA-94	NAS Lemoore	2
VFA-97	NAS Lemoore	1
Fighter Squadron Composite-12	NAS Oceana	4
Marine Fighter Attack Squadron (VMFA)-112	NAS Joint Reserve Base Fort Worth, Texas	2
VMFA-115	MCAS Beaufort	1
VMFA-232	MCAS Miramar	2
VMFA-312	MCAS Beaufort	2
VMFA-323	MCAS Miramar	1
Marine All Weather Fighter Attack Squadron-224	MCAS Beaufort	2
Marine All Weather Fighter Attack Squadron-242	MCAS Iwakuni	1
Marine All Weather Fighter Attack Squadron-533	MCAS Beaufort	4
Marine Fighter Attack Training Squadron-101	MCAS Miramar	6
Air Test and Evaluation Squadron-23	NAS Patuxent River, Maryland	3
Air Test and Evaluation Squadron-31	Naval Air Weapons Station (NAWS) China Lake, California	4
Air Test and Evaluation Squadron-9	NAWS China Lake	2
Total		**141**

(U) Source: The DoD OIG.

(U) Table 12. Breakdown of 10 Aircraft by Organization and Location

Organization	Location	Number of Aircraft in Sample
Naval Aviation Maintenance Center for Excellence	NAS Lemoore	5
Naval Aviation Warfighter Development Center	NAS Fallon, Nevada	4
Test Pilot School	NAS Patuxent River	1
Total		**10**

(U) Source: The DoD OIG.

(U) Inspections and Maintenance

(U) To identify the required organizational-level inspections and maintenance, we obtained a list from PMA-265 of all inspections and maintenance actions that squadrons are required to perform to identify and address corrosion in F/A-18C-G aircraft. We focused our review on the 84-day inspection because a PMA-265 official explained that corrosion is often first identified during the 84-day inspection. The NAMP requires that maintenance personnel document any corrosion discovered during an inspection on a maintenance action form. For the 151 F/A-18C-G aircraft in our statistical sample, we queried DECKPLATE data to determine whether:

- (U) an 84-day inspection was performed on each aircraft as required by the NAMP;
- (U) any maintenance action forms were opened as a result of the 84-day inspection as required by the NAMP; and
- (U) the maintenance action forms opened as a result of the 84-day inspection were addressed and closed out as required by the NAMP.

(U) For the 151 F/A-18C-G aircraft in our statistical sample, we reviewed all 84-day inspections performed between October 1, 2019, and September 30, 2020, documented in DECKPLATE, to determine whether inspections occurred every 84 calendar days (approximately 4 times a year). We reviewed all maintenance action forms in DECKPLATE resulting from the 84-day inspections to determine whether the DON performed the required maintenance by completing the maintenance action forms. We obtained documentation and supporting evidence from DON officials for aircraft that had not performed the required inspections or completed the associated maintenance actions.

(U) Technical Directives Reviewed

(U) To identify the required organizational-level technical directives, we obtained a list from PMA-265 of all technical directives designed to address corrosion in F/A-18C-G aircraft. From the list provided by PMA-265, we determined that the DON was required to implement 14 technical directives at the organizational level for specific aircraft or component parts of aircraft to prevent and correct corrosion. We requested and received documentation from DON officials that we reviewed and analyzed to determine whether the squadrons implemented the 14 organizational-level technical directives to address corrosion. We obtained documentation and supporting evidence from DON officials for aircraft that had not implemented the required technical directives to address corrosion.

(U) Service Life Extension Programs

(U) We reviewed examples of contractor and fleet readiness center-produced reports for aircraft that completed one of the service life extension programs (high flight hour or service life modification). We reviewed these contractor-produced reports to identify where the contractor indicated that the aircraft had corrosion that should have been identified as part of organizational-level maintenance. We interviewed DON officials to determine how the contractor provides information on service life extensions, including how the DON addresses systemic issue areas identified.

(U) Legacy Hornets were originally designed to fly for 6,000 hours. The high flight hour program has extended the service life of the Legacy Hornets to 10,000 hours. Super Hornets were also originally designed to fly for 6,000 hours. The service life modification program has extended the service life of the Super Hornets to 10,000 hours. See Table 13 for the average number of flight hours for F/A-18C-F aircraft as of July 1, 2020.

(U) Table 13. Average Number of Flight Hours for DON F/A-18C-F Aircraft as of July 1, 2020

Aircraft	Aircraft in Inventory	Average Number of Flight Hours Per Aircraft
F/A-18C, Legacy Hornet	235	7,582
F/A-18D, Legacy Hornet	100	7,457
F/A-18E, Super Hornet	306	3,249
F/A-18F, Super Hornet	257	4,053
Total	**898**	

(U) Source: The DON.

(U) Corrosion-Related Maintenance Costs

(U) To identify the costs associated with corrosion-related maintenance, we interviewed officials from the Office of the Assistant Secretary of Defensefor Sustainment - Corrosion Policy and Oversight Office, and reviewed corrosion-related cost data from the Office of the Assistant Secretary of Defense for Sustainment's MADW. MADW uses information from DECKPLATE to identify the costs associated with corrosion-related maintenance by weapon system, including the F/A-18C-G aircraft. We also reviewed MADW data to identify the impact of corrosion on operational availability of F/A-18C-G aircraft and on meeting the DON's mission capable goals for the aircraft.

(U) Site Visit and Interviews

(U) We conducted a site visit to meet with officials from NAVAIR's PMA-265 office at Naval Air Station Patuxent River, Maryland, to determine their roles and responsibilities related to corrosion, and the processes and systems used to identify and document corrosion-related inspections, maintenance, and technical directives.

(U) To determine the processes and systems used to document corrosion at the organizational level, and to gather evidence and documentation for inspections and maintenance performed for the aircraft in our statistical sample, we conducted teleconference interviews with officials from:

- (U) Strike Fighter Wing Atlantic,
- (U) Strike Fighter Wing Pacific,
- (U) Electronic Attack Wing Pacific,
- (U) Naval Air Forces Atlantic,
- (U) Naval Air Training Command,
- (U) 2nd Marine Aircraft Wing, and
- (U) 3rd Marine Aircraft Wing.

(U) Internal Control Assessment and Compliance

(U) We assessed internal controls and compliance with laws and regulations necessary to satisfy the audit objective. In particular, we assessed the control components and underlying principles related to the reporting process of DECKPLATE. Specifically, we assessed the information and communication that management and personnel use to determine the quality of information from DECKPLATE. Information and communication by management and personnel includes the relevancy of data they enter and use. However, after we reviewed

(U) DECKPLATE documentation and access controls, and developed strategies to mitigate this risk, we determined that this internal control is not significant to the audit objective.

(U) In addition, we assessed the control activities within the established process to determine whether the DON implemented effective internal controls for reviewing maintenance action forms. This internal control process relies on the closure of maintenance action forms that the DON establishes through policies and procedures in response to achieve objectives through the DON's information system. DON personnel did not effectively perform the established procedures to close maintenance action forms.

(~~CUI~~) We found that maintenance personnel manually entered incorrect maintenance data into [redacted] In addition, we found instances when maintenance personnel did not close maintenance action forms. For example, [redacted] These operating deficiencies could potentially be a cause of insufficient training or human error by maintenance personnel who use this system and process on a daily basis. However, because our review was limited to these internal control components and underlying principles, it may not have disclosed all internal control deficiencies that may have existed at the time of this audit.

(U) Use of Computer-Processed Data

(U) We used computer-processed data from DECKPLATE, NALCOMIS OOMA, DECKPLATE-AIRRS, and the Office of the Assistant Secretary of Defense for Sustainment's MADW. To determine the reliability of this computer-processed data, we reviewed the systems' access controls, user manuals, and data element dictionaries. Additionally, we interviewed DoD officials with knowledge of these systems on the reliability of the data. We determined that the data were sufficiently reliable for the use of this audit.

(U) DECKPLATE

(U) We used computer-processed data from DECKPLATE to perform this audit. DECKPLATE is Naval Aviation's authoritative source for maintenance and logistics data. We used the following data from the DECKPLATE Technical Directive and Kit Management Modules.

- (U) Applicability List (LIST01)
- (U) Incorporated/Not Incorporated Listing for Technical Directives (LIST07)
- (U) Technical Directive Incorporation Listing (REP07)

(~~CUI~~) [redacted] We compared the LIST01 to the LIST07 to determine whether the DON had incorporated corrosion-related technical directives on affected aircraft as required.

(U) We used information from DECKPLATE-AIRRS, which provides the aviation community with aircraft inventory, readiness, and flight or utilization data for each aircraft in the naval inventory. Specifically, we used the F/A-18A-F and EA-18G Flight Hour and Inventory Report from DECKPLATE-AIRRS. We used this report to determine the number of F/A-18C-F aircraft that are undergoing or have completed the high flight hour or service life modification programs. We also used the data to determine the number of flight hours the aircraft had when they entered a service life extension program, the operating status of each aircraft, and the current owner and location of each aircraft. We also used XRAY Reports from DECKPLATE-AIRRS to determine the status and ownership of the aircraft during specific 84-day inspections performed in FY 2020.

(U) Additionally, a DON official with knowledge of DECKPLATE created a customized report in DECKPLATE for the audit team. The report included all of the inspections and maintenance actions for the 151 aircraft in our sample from FY 2020. We compared this data to supporting documents and criteria to determine whether the DON had performed corrosion-related inspections and maintenance as required.

(U) NALCOMIS OOMA

(U) We used computer-processed data from NALCOMIS OOMA to perform this audit. NALCOMIS OOMA is a management information system used by the DON to document organizational-level maintenance. Specifically, we used work

(U) orders from NALCOMIS OOMA. The DON uses work orders to document inspections and maintenance actions. We compared the work orders, and other supporting documents, to criteria to determine whether the DON had performed corrosion-related inspections and maintenance as required.

(U) MADW

(U) We also used computer-processed data from MADW received from the Office of the Assistant Secretary of Defense for Sustainment. Data from other DoD systems, such as the DON's DECKPLATE system, flow into MADW. MADW converts the data into a standard format, which allows users to identify the costs associated with corrosion-related maintenance by weapon system. We used the data in MADW to calculate the cost to the DON of addressing corrosion for F/A-18C-G aircraft and the impact to readiness in F/A-18C-G aircraft.

(U) Use of Technical Assistance

(U) The Quantitative Methods Division assisted with the project sample selection and statistical projection of results. See Appendix B for the statistical sample plan.

(U) Prior Coverage

(U) During the last 5 years, the Government Accountability Office (GAO) and the DoD Office of Inspector General (DoD OIG) issued four reports discussing F/A-18 aircraft and corrosion efforts. Unrestricted GAO reports can be accessed at http://www.gao.gov. Unrestricted DoD OIG reports can be accessed at http://www.dodig.mil/reports.html/.

(U) GAO

(U) Report No. GAO-19-513, "Defense Management - Observations on Changes to the Reporting Structure for DoD's Corrosion Office and Its Implementation of GAO Recommendations," May 17, 2019

> (U) The GAO found that the DoD relocated the Office of Corrosion Policy and Oversight within the Office of the Under Secretary of Defense for Acquisition and Sustainment, where it reports to the Deputy Assistant Secretary of Defense for Materiel Readiness. The GAO determined that the DoD was planning to increase corrosion advocacy throughout the DoD, oversight of the Corrosion Office, corrosion accountability of the Military Departments, and corrosion transparency and its alignment with materiel readiness.

(U) Report No. GAO-19-39, "Defense Management - DoD Should Take Additional Actions to Enhance Corrosion Prevention and Mitigation Efforts," November 8, 2018

(U) The GAO assessed the extent to which the DoD has consistently reported the funding levels needed to perform the Corrosion Executives' duties and provided oversight of corrosion planning for major weapon system programs. The GAO found that the DoD Office of Corrosion Policy and Oversight has not issued guidance to require a standard process to use for identifying funding levels and maintaining documentation. The GAO also found that the DoD Office of Corrosion Policy and Oversight does not have a documented process for reviewing the information it receives from the military departments for inclusion in the annual reports and will continue to inconsistently inform Congress on the funding levels.

(U) Report No. GAO-18-678, "Weapon System Sustainment - Selected Air Force and Navy Aircraft Generally Have Not Met Availability Goals, and DoD and Navy Guidance Need to be Clarified," September 10, 2018

(U) The GAO evaluated the Navy and Air Force sustainment of major weapon systems to examine trends in availability and costs (operation and service costs) in fixed-wing aircraft. The GAO determined that between FYs 2011 and 2016, the Air Force and Navy generally did not meet aircraft availability goals and faced challenges with aging airframes, maintenance, and supply issues.

(U) DoD OIG

(U) Report No. DODIG-2021-004, "Audit of the Department of the Navy Actions Taken to Improve Safety and Reduce Physiological Events," November 4, 2020

(U) The DON implemented technical directives to improve safety and reduce physiological events experienced by aircrew in F/A-18 aircraft. Although this report does not address corrosion, it does address maintenance and upgrades to F/A-18 aircraft systems, including implementing technical directives or changes that will be similar to the actions taken by the DON to reduce corrosion in F/A-18C-G aircraft.

(U) Appendix B

(U) Statistical Sample Plan and Projection

(U) Objective

(U) The objective of this audit was to determine whether Navy and Marine Corps officials performed required inspections and maintenance to identify and address (prevent and correct) corrosion in F/A-18C-G aircraft and implemented, or plan to implement, technical directives to address corrosion on F/A-18C-G aircraft in accordance with DoD requirements.

(U) Population

(U) Universe of 1,060 F/A-18C-G aircraft.

(U) Parameters

(U) We used a 90-percent confidence level and 5 percent precision to calculate the required sample size for the sample design.

(U) Sample Plan

(U) The Quantitative Methods Division developed an attribute sampling design in which the population was stratified into the following three strata based on the F/A-18C-G aircraft type/model/series: Legacy Hornets, Super Hornets, and Growlers. Samples were drawn from each stratum without replacement. The RAND() function in Microsoft Excel was used to randomize the population. The stratum and the sample sizes are shown in Table 14.

(U) Table 14. Sample Size by Stratum

Stratum Name	Stratum Population Size	Stratum Sample Size
Legacy Hornets	335	48
Super Hornets	563	80
Growlers	162	23
Total	**1,060**	**151**

(U) Source: The DoD OIG.

(U) Fieldwork Results

(U) The audit team analyzed the 151 aircraft in the sample to determine:

- (U) aircraft that received at least four 84-day inspections,
- (U) aircraft that received fewer than four 84-day inspections with a valid reason, and
- (U) aircraft that received fewer than four 84-day inspections without a valid reason.

(U) The Quantitative Methods Division calculated statistical projections based on the results provided by the audit team. Table 15 shows the statistical projections to the universe for aircraft receiving at least four 84-day inspections in FY 2020. This statistical projection had a 90-percent confidence level.

(~~CUI~~) Table 15. Aircraft That Received at Least Four 84-day Inspections

(~~CUI~~) Aircraft That Received at Least Four 84-Day Inspections	Lower Bound	Point Estimate	Upper Bound
Rate (Percent)	[redacted]	[redacted]	[redacted]
Number	[redacted]	[redacted]	[redacted] (~~CUI~~)

(U) Source: The DoD OIG.

(~~CUI~~) As Table 15 shows, we projected with a 90-percent confidence level that the percentage of aircraft that received at least four 84-day inspections is between [redacted] percent and [redacted] percent, with a point estimate of [redacted] percent. The corresponding projected number of aircraft that received at least four 84-day inspections is between [redacted] and [redacted], with a point estimate of [redacted]

(U) Table 16 shows the statistical projections to the universe for aircraft receiving fewer than four 84-day inspections in FY 2020 but with a valid reason for not having an 84-day inspection. This statistical projection had a 90-percent confidence level.

~~(CUI)~~ Table 16. Aircraft That Received Fewer Than Four 84-Day Inspections With a Valid Reason

~~(CUI)~~ Aircraft That Received Fewer Than Four 84-Day Inspections With a Valid Reason	Lower Bound	Point Estimate	Upper Bound
Rate (Percent)	[redacted]	[redacted]	[redacted]
Number	[redacted]	[redacted]	[redacted] ~~(CUI)~~

(U) Source: The DoD OIG.

(~~CUI~~) As Table 16 shows, we projected with a 90-percent confidence level that the percentage of aircraft that received fewer than four 84-day inspections with a valid reason is between [redacted] percent and [redacted] percent, with a point estimate of [redacted] percent. The corresponding projected number of aircraft that received fewer than four 84-day inspections with a valid reason is between [redacted] and [redacted], with a point estimate of [redacted]

(U) Table 17 shows the statistical projections to the universe for aircraft that received fewer than four 84-day inspections in FY 2020 that did not have a valid reason for not having an 84-day inspection. This statistical projection has a 90-percent confidence level.

~~(CUI)~~ Table 17. Aircraft That Received Fewer Than Four 84-Day Inspections Without a Valid Reason

~~(CUI)~~ Aircraft That Received Fewer Than Four 84-Day Inspections Without a Valid Reason	Lower Bound	Point Estimate	Upper Bound
Rate (Percent)	[redacted]	[redacted]	[redacted]
Number	[redacted]	[redacted]	[redacted] ~~(CUI)~~

(U) Source: The DoD OIG.

(~~CUI~~) As Table 17 shows, we projected with a 90-percent confidence level that the percentage of aircraft that received fewer than four 84-day inspections without a valid reason is between [redacted] percent and [redacted] percent, with a point estimate of [redacted] percent. The corresponding number of aircraft that received fewer than four 84-day inspections without a valid reason is between [redacted] and [redacted] with a point estimate of [redacted]

(U) Management Comments

(U) Commander, Naval Air Forces

~~CUI~~

DEPARTMENT OF THE NAVY
COMMANDER NAVAL AIR FORCES
BOX 357051
SAN DIEGO CA 92135-7051

4790
Ser N42/
23 Aug 21

From: Commander Naval Air Forces
To: Inspector General, Department of Defense

Subj: DEPARTMENT OF DEFENSE OFFICE OF INSPECTOR GENERAL REPORT ON PROJECT NO. D2021-D000RK-0010.000

Ref: (a) DoD OIG Report on Project No. D2021-D000RK-0010.000

Encl: (1) Detailed Work Order data

~~(CUI)~~ 1. [redacted]

~~(CUI)~~ a. [redacted]

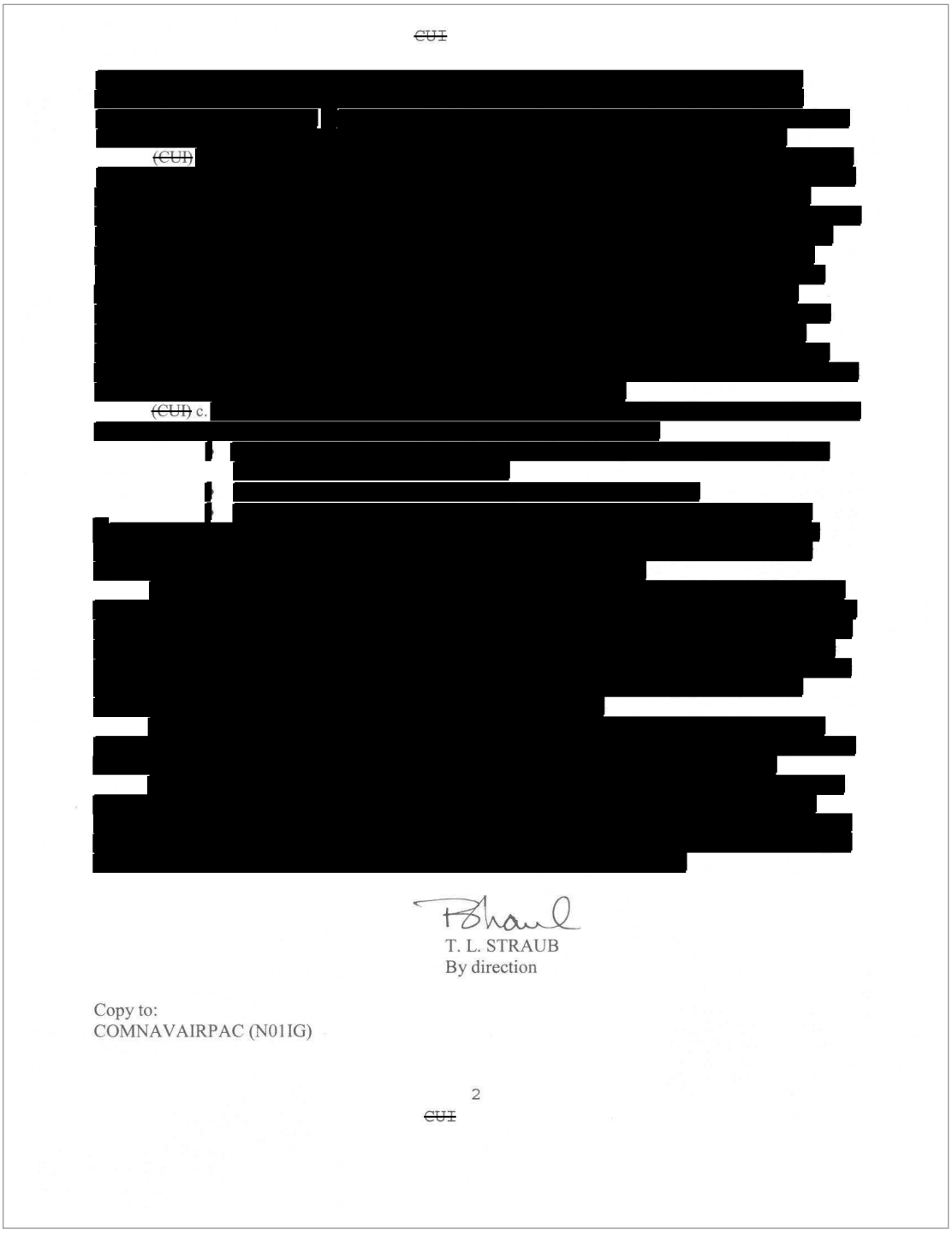
~~(CUI)~~ [redacted]

~~(CUI)~~ b. [redacted]

~~Controlled by: United States Navy COMNAVAIRPAC~~
~~CUI Category: Intelligence/OPSEC~~
~~Distribution/Dissemination: FEDCON~~
~~POC: Assistant Chief of Staff, Force Maint/Mtrl~~ [redacted]

~~CUI~~

(U) Commander, Naval Air Forces (cont'd)



~~CUI~~

[redacted]

~~(CUI)~~ [redacted]

~~(CUI)~~ c. [redacted]

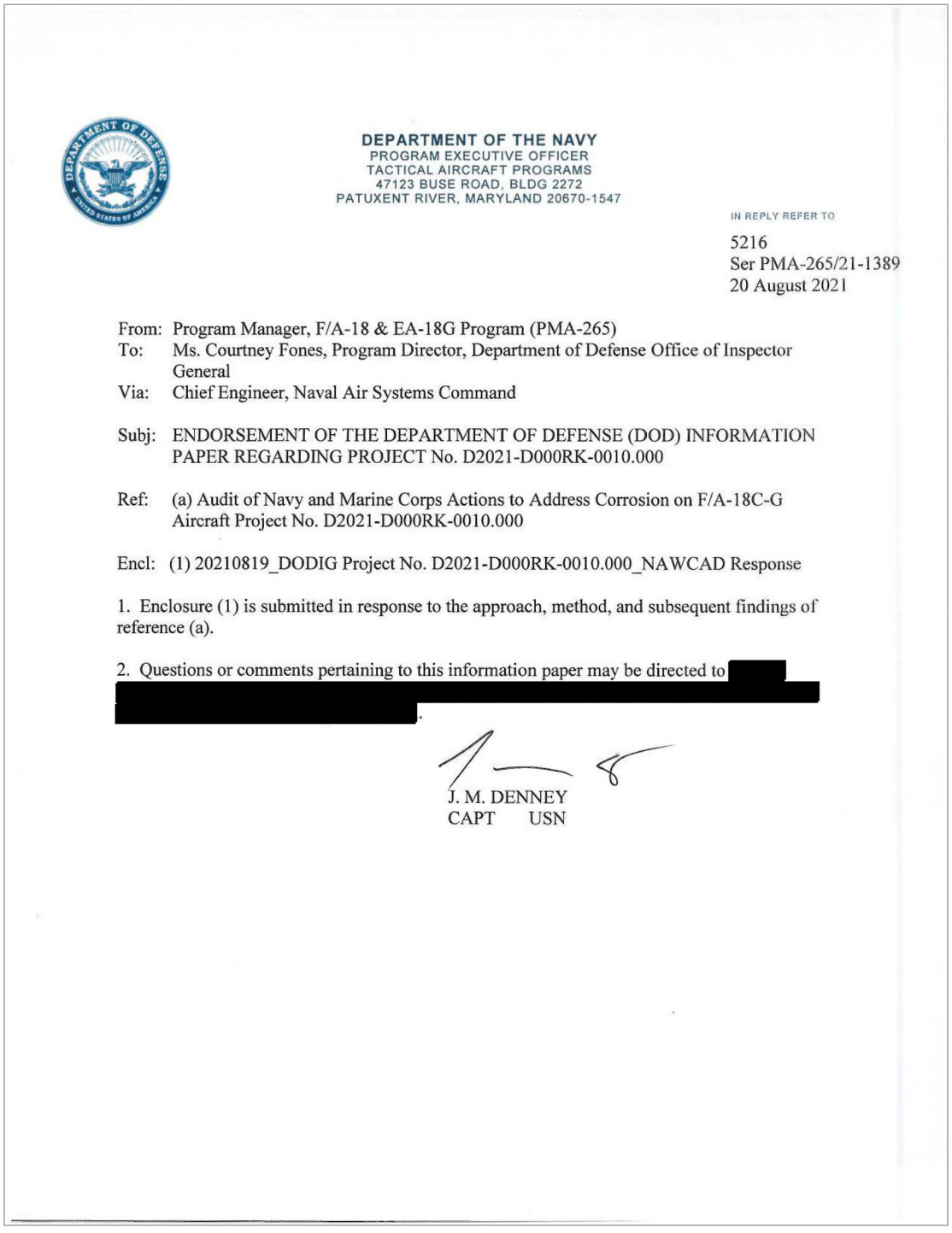
T. L. STRAUB
By direction

Copy to:
COMNAVAIRPAC (N01IG)

2

~~CUI~~

(U) PMA-265



DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
TACTICAL AIRCRAFT PROGRAMS
47123 BUSE ROAD, BLDG 2272
PATUXENT RIVER, MARYLAND 20670-1547

IN REPLY REFER TO
5216
Ser PMA-265/21-1389
20 August 2021

From: Program Manager, F/A-18 & EA-18G Program (PMA-265)
To: Ms. Courtney Fones, Program Director, Department of Defense Office of Inspector General
Via: Chief Engineer, Naval Air Systems Command

Subj: ENDORSEMENT OF THE DEPARTMENT OF DEFENSE (DOD) INFORMATION PAPER REGARDING PROJECT No. D2021-D000RK-0010.000

Ref: (a) Audit of Navy and Marine Corps Actions to Address Corrosion on F/A-18C-G Aircraft Project No. D2021-D000RK-0010.000

Encl: (1) 20210819_DODIG Project No. D2021-D000RK-0010.000_NAWCAD Response

1. Enclosure (1) is submitted in response to the approach, method, and subsequent findings of reference (a).

2. Questions or comments pertaining to this information paper may be directed to [redacted].

J. M. DENNEY
CAPT USN

(U) PMA-265 (cont'd)

DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
RADM WILLIAM A MOFFETT BUILDING
47123 BUSE ROAD BLDG 2272
PATUXENT RIVER MARYLAND 20670-1547

5216
Ser AD-00/21U230
20 Aug 21

From: Chief Engineer, Naval Air Systems Command
To: Program Executive Officer, F/A-18 & EA-18G Program (PMA-265)

Subj: ENDORSEMENT OF THE PMA-265 INFORMATION PAPER TO DEPARTMENT OF DEFENSE (DOD) INSPECTOR GENERAL DRAFT REPORT PROJECT No. D2021-D000RK-0010.000

Ref: (a) Audit of Navy and Marine Corps Actions to Address Corrosion on F/A-18C-G Aircraft Project No. D2021-D000RK-0010.000

Encl: (1) 20210816_DODIG Draft Report Project No. D2021-D000RK-0010.000_PMA-265 Info Paper

1. NAVAIR CHENG concurs and endorses PMA-265 F/A-18 Program Office information paper in response to the reference Department of Defense Inspector General (DOD IG) audit draft report's approach in scope, method, and subsequent findings.

2. Questions or comments pertaining to this subject may be directed to [redacted].

JOHN S. LEMMON
Rear Admiral, United States Navy

(U) PMA-265 (cont'd)

~~CUI~~

PMA-265 F/A-18 PROGRAM OFFICE
INFORMATION PAPER
DODIG DRAFT REPORT PROJECT No. D2021-D000RK-0010.000

16 August 2021

~~**DISTRIBUTION STATEMENT D: Distribution authorized to Department of Defense and U.S. DoD contractors only (Critical Technologies) (30 Sep 2019). Other requests for this document shall be referred to Department of the Navy, Program Executive Officer Tactical Aircraft Programs, PMA-265,** [redacted]~~

~~**WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et seq.) or the Export Administration Act of 1979 (Title 50, U.S.C., App. 2401 et seq.), as amended. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.**~~

~~**HANDLING AND DESTRUCTION NOTICE: Comply with distribution statement and destroy by any method that will prevent disclosure of contents or reconstruction of the document. (Note: DoDM 5200.01-V3 refers for destruction requirements).**~~

~~Controlled By: Department of the Navy~~
~~NAVAIRSYSCOM, PEO (T), PMA-265~~
~~CUI Category: CTI/OPSEC~~
~~Dissemination Controls: DISTRIBUTION D~~
~~POC, PM: CAPT Jason M. Denney,~~ [redacted]
~~POC, TECH:~~ [redacted]

~~CUI~~

(U) PMA-265 (cont'd)

~~CUI~~

PMA-265 F/A-18 PROGRAM OFFICE
INFORMATION PAPER
DODIG DRAFT REPORT PROJECT No. D2021-D000RK-0010.000

(U) **SERVICE/AGENCY:** U. S. NAVY / F/A-18 EA-18G Program Office (PMA-265)
(U) **SUBJECT:** Draft Report – Audit of Navy and Marine Corps Actions to Address Corrosion in FA-18C-G Aircraft
(U) **DATE:** 16 August 2021

(U) **BACKGROUND:** This audit was performed in response to a reporting requirement for the DoD Office of Inspector General contained in the House Armed Services Committee report that accompanied the National Defense Authorization Act for FY 2021. Specifically, the Committee asked us to review whether Department of Navy (DON) maintainers performed organizational-level maintenance to address corrosion in F/A-18C-G aircraft.

(U) **RESPONSE:** This white paper is a response to the subject report's approach in scope, methods, and subsequent findings. The audit's findings concluded two things:

1. (U) Maintainers did not always perform the Organizational-level (O-Level) inspections or maintenance required or to the DON standards;
2. (U) Officials responsible for the oversight did not identify and correct the work.

(U) An additional note in the findings discussion states, "…the DON took actions to improve the condition of the aircraft entering the service life extension programs, including training, meetings, coordination and detailed inspections."

(U) While the Department of Defense Inspector General's (DOD IG's) audit was thorough in the defined scope, our position is that the sampling methods used to draw statistical conclusions was incomplete, did not take advantage of all data provided; and the scope was too narrowly defined to create a holistic view of the issue, findings, and solution sets.

~~(CUI)~~ The Office of the Assistant Secretary of Defense for Sustainment's Maintenance and Availability Data Warehouse (MADW) site the [redacted]

(U) The focus on the O level maintenance without evaluating other corrosion underlying factors will leave the reader with a misleading impression of the scope of the corrosion issues and changes

~~CUI~~

(U) PMA-265 (cont'd)

~~CUI~~

required to rectify aircraft corrosion. Additionally, the sole focus on maintenance, especially O level maintenance, can bias solutions, placing increased undue burden on our warfighters. Instead, a more thorough investigation on all aspects of the root causes of corrosion and the trade space to address those issues is warranted. Simply put, the reader could assume that by correcting the organizational level findings, all corrosion will be eliminated. An aggressive corrosion management program can significantly reduce the occurrence of corrosion, but it cannot entirely eliminate those occurrences.

(U) The DOD IG's report does acknowledge there are open, unaudited areas as found in the "Results in Brief" section, "Based on reporting by the contractor to the DON and House Armed Services Committee the DON took actions to improve the condition of the aircraft". However, the strict interpretation of the charter prevented the DoD IG from investigating root causes beyond the organizational factors such as operating environment, aircraft design, design changes, and training.

(U) Three factors contribute to corrosion of the aircraft:

- (U) Environment (Natural and Operational)
- (U) Design
- (U) Maintenance at organizational, intermediate (I-level) or depot levels (D-level)

(U) The F/A-18's historical strategy is to optimize design and maintenance practices to match the environment. The singular focus on O level maintenance, limited the investigation into other factors affecting corrosion on the platform. These issues, whether uncovered as part of the Independent Logistics Audit (ILA), Naval Sustainment System (NSS) initiatives or Reliability Control Board (RCB), incorporate a holistic approach to addressing corrosion. Other initiatives are ongoing to address F/A-18 corrosion including:

- ~~(CUI)~~ [redacted]
- ~~(CUI)~~ [redacted]
- ~~(CUI)~~ [redacted]

~~CUI~~

(U) PMA-265 (cont'd)

~~CUI~~

(U) PMA-265 and the NAE recognize the burdens of corrosion prevention on the fleet and continue to pursue long term solutions using the above mentioned initiatives over the platform's lifecycle. PMA-265 draws from a diverse pool of talent including the original equipment manufacturer, the navy fleet support team, and other corrosion experts across the Navy to continually evaluate this complex interaction. The integrated corrosion team informs program leadership on courses of action to either change the design or change maintenance due the ever-changing operating demands on the platform. PMA-265 will continue to lead efforts in evaluating these multi-faceted variables and make recommendations to NAE leadership on a balanced approach incorporating fleet safety and effectiveness, as well as cost.

~~CUI~~

(U) Acronyms and Abbreviations

(U) AEB	Age Exploration Bulletin
(U) AFB	Airframe Bulletin
(U) AFC	Airframe Change
(U) AIRRS	Aircraft Inventory and Readiness Reporting System
(U) AYB	Accessory Bulletin
(U) AYC	Accessory Change
(U) BUNO	Bureau Number
(U) DECKPLATE	Decision Knowledge Programming for Logistics Analysis and Technical Evaluation
(U) DON	Department of the Navy
(U) MADW	Maintenance and Availability Data Warehouse
(U) NALCOMIS OOMA	Naval Aviation Logistics Command Management Information System Optimized Organizational Maintenance Activity
(U) NAMP	Naval Aviation Maintenance Program
(U) NAVAIR	Naval Air Systems Command
(U) PMA	Program Manager Air

Whistleblower Protection
U.S. Department of Defense

Whistleblower Protection safeguards DoD employees against retaliation for protected disclosures that expose possible fraud, waste, and abuse in Government programs. For more information, please visit the Whistleblower webpage at http://www.dodig.mil/Components/Administrative-Investigations/Whistleblower-Reprisal-Investigations/Whisteblower-Reprisal/ or contact the Whistleblower Protection Coordinator at Whistleblowerprotectioncoordinator@dodig.mil

For more information about DoD OIG reports or activities, please contact us:

Congressional Liaison
703.604.8324

Media Contact
public.affairs@dodig.mil; 703.604.8324

DoD OIG Mailing Lists
www.dodig.mil/Mailing-Lists/

Twitter
www.twitter.com/DoD_IG

DoD Hotline
www.dodig.mil/hotline

DEPARTMENT OF DEFENSE | OFFICE OF INSPECTOR GENERAL

4800 Mark Center Drive
Alexandria, Virginia 22350-1500
www.dodig.mil
DoD Hotline 1.800.424.9098