Report No. DODIG-2018-146

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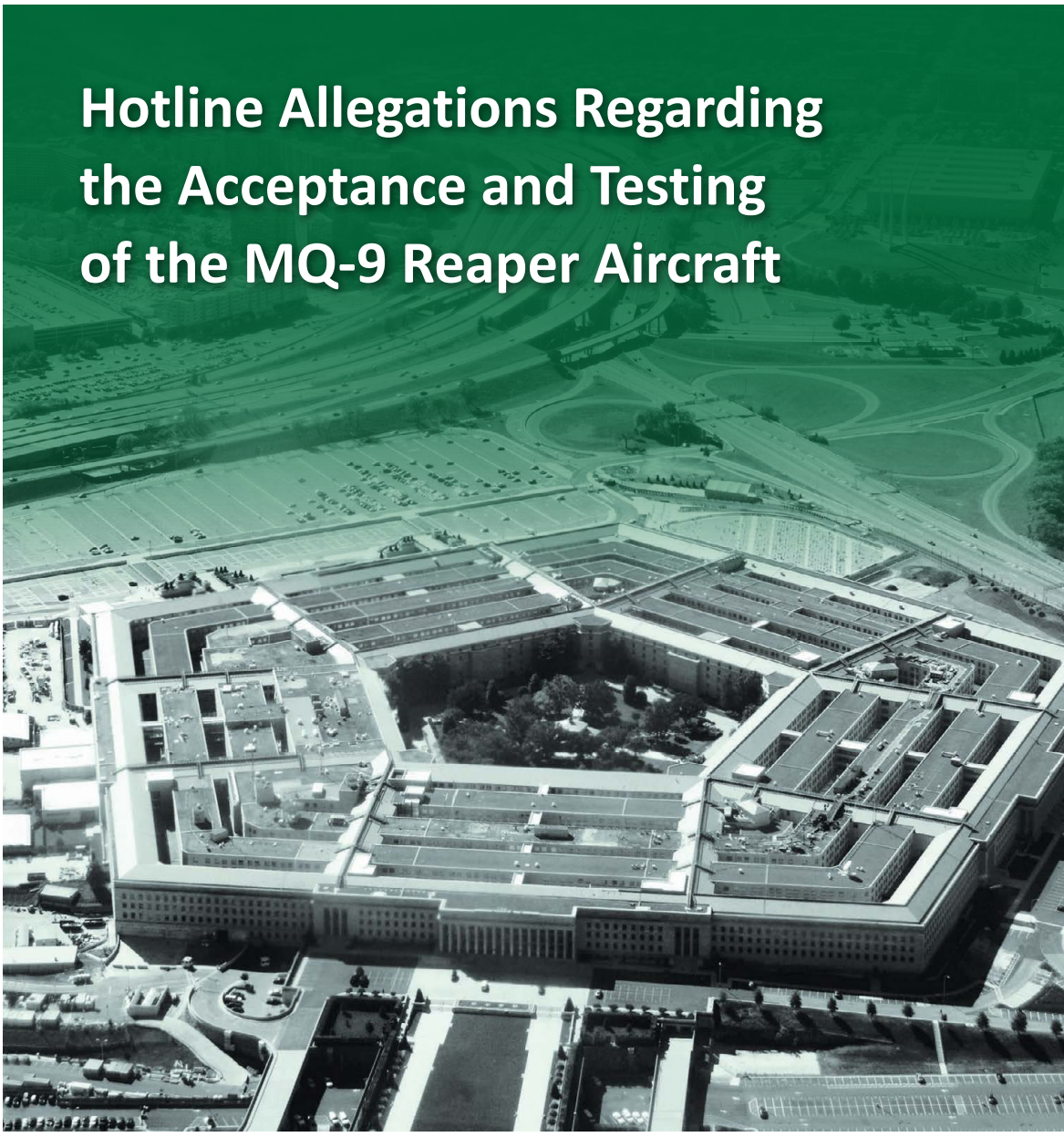
INSPECTOR GENERAL

U.S. Department of Defense

AUGUST 16, 2018

Hotline Allegations Regarding the Acceptance and Testing of the MQ-9 Reaper Aircraft



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Results in Brief

Hotline Allegations Regarding the Acceptance and Testing of the MQ-9 Reaper Aircraft

August 16, 2018

Objective

We evaluated a Defense Hotline complaint regarding the acceptance and testing of the MQ-9 Reaper aircraft. Specifically, we evaluated the following allegations:

- Allegation 1 – The Detachment 3 (Det 3) Lead Engineer miscategorized and inappropriately accepted nonconforming material.[1]
- Allegation 2 – Operating Location-Detachment 3 (OL-Det 3) personnel performed flight tests early in the morning to prevent the aircraft from overheating and obtain favorable flight test results.

In addition to the Defense Hotline complaint, we also evaluated the MQ-9 Reaper's average lifetime Class A mishap rate to determine whether the mishap rate was consistent with similar DoD unmanned aircraft vehicles.[2]

Background

The Air Force MQ-9 Reaper is an unmanned aircraft equipped with weapon and surveillance systems. General Atomics Aeronautical Systems, Incorporated (GA-ASI) is the Air Force contractor that manufactures the MQ-9 Reaper and operates the MQ-9 Reaper flight test facility. The MQ-9 Reaper System Program Office (SPO) manages the acquisition and delivery of the MQ-9 Reaper. The SPO is located at Wright-Patterson Air Force Base, Ohio.

[1] Nonconforming material is a supply or service that does not meet all contract requirements.

[2] DoD mishap is an unplanned event or series of events that results in damage to DoD property. A Class A mishap is the most severe event with damages in excess of $2 million.

Background (cont'd)

~~(FOUO)~~ Det 3, located at the GA-ASI manufacturing facility in Poway, California, performs onsite contract and engineering oversight of GA-ASI for the MQ-9 Reaper. OL-Det 3, located at the GA-ASI flight test facility [redacted] performs flight tests of the MQ-9 Reaper.

Findings

We reviewed 44 reports of MQ-9 Reaper nonconforming material and determined that the Det 3 Lead Engineer appropriately categorized and accepted nonconforming material, in accordance with Federal Acquisition Regulation (FAR) Part 46, "Quality Assurance."[3] The Det 3 Lead Engineer determined and documented that GA-ASI's recommendations for repair and acceptance of the nonconforming material was in the best interest of the SPO as allowed in FAR Part 46.

We also reviewed MQ-9 Reaper flight test records from March 8, 2017, to October 17, 2017, and determined that OL-Det 3 personnel performed all 48 acceptance flight tests between 8:26 a.m. and 3:34 p.m. when outside air temperatures were within the range specified in the contract.

Therefore, we did not substantiate the allegations. However, we determined that the SPO did not have two key documents. First, the SPO did not have an official memorandum to delegate Det 3 engineers the authority to accept nonconforming material, as required by Air Force Materiel Command Instruction 63-1201, "Implementing Operational Safety, Suitability and Effectiveness and Life Cycle Systems Engineering," March 28, 2017. Without an official delegation of authority memorandum, the Det 3 engineers could misunderstand or potentially abuse their specific roles, responsibilities, and authorities, which could result in the inappropriate acceptance of major or critical nonconforming material.

[3] FAR 46.407 states that a contracting officer is allowed to accept nonconforming material if it is in the Government's best interest for reasons such as economy and urgency.

Results in Brief

Hotline Allegations Regarding the Acceptance and Testing of the MQ-9 Reaper Aircraft

Findings (cont'd)

Second, the SPO did not have adequate documentation related to critical safety items. Specifically, the SPO did not develop a comprehensive critical safety items list. Critical safety items are parts, assemblies, or equipment for an aircraft or aviation weapons system that contain a characteristic where any failure, malfunction, or absence could cause a catastrophic or critical failure resulting in the loss or serious damage to the aircraft or weapons system. The SPO provided lists of critical safety items. However, the lists did not identify the prime contractor, the original equipment manufacturer, and alternate sources of manufacture, supply, or repair for each of the critical safety items, as required by Air Force Instruction 20-106, "Management of Aviation Critical Safety Items," January 25, 2006. Without a critical safety items list meeting the requirements of Air Force Instruction 20-106, Det 3 engineers could overlook critical safety item criteria leading to inappropriate acceptance of nonconforming material.

Finally, we determined that the MQ-9 Reaper average lifetime Class A mishap rate was consistent with a similar unmanned aircraft vehicle, the Q-4 Global Hawk. We also determined that the MQ-9 Reaper average lifetime Class A mishap rate had significantly improved from its predecessor, the MQ-1 Predator.

Recommendations

We recommend that the SPO Senior Materiel Leader formally delegate to Det 3 engineers the authority to accept nonconforming material, as required by Air Force Materiel Command Instruction 63-1201.

We recommend that the SPO Senior Materiel Leader develop and approve a comprehensive critical safety items list, as required by Air Force Instruction 20-106.

Management Comments and Our Response

The Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces, responding for the SPO Senior Materiel Leader, agreed with the recommendations. Specifically, the Program Executive Officer stated that the SPO will formally delegate authority to the Det 3 Chief Engineer and incorporate a critical safety items list into all applicable contracts. The Program Executive Officers comments and planned corrective actions adequately addressed the specifics of the recommendations. Therefore, the recommendations are resolved, but remain open. We will close the recommendations once we verify that the planned corrective actions have been implemented.

Please see the Recommendations Table on the next page.

Recommendations Table

Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
Medium Altitude Unmanned Aircraft Systems Division Chief, MQ-9 Reaper System Program Office, Senior Materiel Leader	None	C.1, C.2	None

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

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


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August 16, 2018

MEMORANDUM FOR AUDITOR GENERAL, DEPARTMENT OF THE AIR FORCE
MEDIUM ALTITUDE UNMANNED AIRCRAFT SYSTEMS DIVISION
CHIEF (AFLCMC/WII), SENIOR MATERIEL LEADER

SUBJECT: Hotline Allegations Regarding the Acceptance and Testing of the MQ-9 Reaper Aircraft (Report No. DODIG-2018-146)

We are providing this report for your information and use. We conducted this evaluation in accordance with the "Quality Standards for Inspections and Evaluations," published in January 2012 by the Council of the Inspectors General on Integrity and Efficiency.

We considered management comments on a draft of this report when preparing the final report. Comments from the Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces, responding for the System Program Office Senior Materiel Leader, addressed all specifics of the recommendations and conformed to the requirements of DoD Instruction 7650.03; therefore, we do not require additional comments.

We appreciate the courtesies extended to the staff. Please direct questions to Mr. Timothy W. Lamb at (703) 604-9150 (DSN 664-9150).

Randolph R. Stone
Deputy Inspector General
Policy and Oversight

cc: Director, Defense Contract Management Agency

Contents

Introduction

Objective

We evaluated a Defense Hotline complaint regarding the acceptance and testing of the MQ-9 Reaper aircraft. Specifically, we evaluated the following allegations.

- Allegation 1 – The Detachment 3 (Det 3) Lead Engineer miscategorized and inappropriately accepted nonconforming material.[4]
- Allegation 2 – Operating Location-Detachment 3 (OL-Det 3) personnel performed flight tests early in the morning to prevent the aircraft from overheating and obtain favorable flight test results.

In addition to the Defense Hotline complaint, we also evaluated the MQ-9 Reaper average lifetime Class A mishap rate to determine whether the mishap rate was consistent with similar DoD unmanned aircraft vehicles.[5] See the Appendix for our scope and methodology.

Background

The Air Force MQ-9 Reaper is an unmanned aircraft equipped with weapon and surveillance systems. The MQ-9 Reaper program is an Acquisition Category IC Major Defense Acquisition Program.[6] General Atomics Aeronautical Systems, Incorporated (GA-ASI) in Poway, California is the Air Force contractor that develops and produces the MQ-9 Reaper.

The Air Force has deployed the MQ-9 Reaper to support overseas contingency operations since September 2007. The MQ-9 Reaper unmanned aircraft system consists of a remotely piloted aircraft, ground control station, communications equipment, and associated support equipment. The MQ-9 Reaper has a wingspan of 66 feet and is 36 feet long. It is capable of flying up to a maximum altitude of 45,000 feet and at a cruise speed of around 230 miles per hour (200 knots).[7]

[4] Federal Acquisition Regulation (FAR) 46.407, "Nonconforming Supplies or Services," identifies nonconforming material as a supply or service that does not meet all contract requirements. Further, FAR 2.1, "Definitions," defines supplies as including aircraft and aircraft parts, accessories, equipment, and the alteration or installation of the same.

[5] DoD Instruction 6055.07, "Mishap Notification, Investigation, Reporting, and Record Keeping," June 6, 2011, defines a DoD mishap as an unplanned event, or series of events, that results in damage to DoD property. A Class A mishap is the most severe event with damages in excess of $2 million.

[6] An Acquisition Category IC is a Major Defense Acquisition Program that has an estimated total spending of more than $480 million for research, development, test, and evaluation in FY 2014 constant dollars or, for procurement, more than $2.79 billion in FY 2014 constant dollars with the DoD Component Acquisition Executive as the decision authority. (Constant dollars are the result of current dollar estimates divided by appropriate price indices.)

[7] MQ-9 Reaper Fact Sheet. http://www.af.mil/About-Us/Fact-Sheets/Display/Article/104470/mq-9-reaper/.

Figure 1 shows a picture of the Air Force MQ-9 Reaper.

Figure 1. U.S. Air Force MQ-9 Reaper
Source: U.S. Air Force website.

Medium Altitude Unmanned Aircraft Systems Division

~~(FOUO)~~ The Air Force Life Cycle Management Center, Medium Altitude Unmanned Aircraft Systems Division (AFLCMC/WII), Wright-Patterson Air Force Base, Ohio, manages the acquisition and sustainment of the MQ-9 Reaper and other unmanned aircraft systems. The MQ-9 System Program Office (SPO), led by the AFLCMC/WII Senior Materiel Leader manages the acquisition and delivery of the MQ-9 Reaper. The SPO established Det 3 and OL-Det 3 to perform onsite support of program management, engineering, integration, logistics, and flight tests. Det 3 is located at the GA-ASI manufacturing facility in Poway, California, and OL-Det 3 is located at the GA-ASI flight test facility [redacted].

Finding A

The Det 3 Lead Engineer Appropriately Categorized and Accepted Nonconforming Material

We reviewed 44 reports of MQ-9 Reaper nonconforming material and determined that the Det 3 Lead Engineer appropriately categorized the nonconforming material reports in accordance with Federal Acquisition Regulation (FAR) Part 46, "Quality Assurance." We also determined that the Det 3 Lead Engineer appropriately accepted GA-ASI's recommendations for the 44 nonconforming material reports. Therefore, we did not substantiate that the Det 3 Lead Engineer miscategorized and inappropriately accepted nonconforming material.

Allegation 1

The Det 3 Lead Engineer miscategorized and inappropriately accepted MQ-9 Reaper nonconforming material.

Criteria

FAR Requirements

The FAR is the primary regulation for use by all Federal Executive agencies in their acquisition of supplies and services with appropriated funds.[8] We used two sections in FAR Part 46, "Quality Assurance," to evaluate acceptance of MQ-9 Reaper nonconforming material.

FAR 46.101, "Definitions," provides the following categories of nonconforming material.

- A minor nonconforming material is not likely to materially reduce the usability of the supplies or services for their intended purpose or is a departure from established standards having little bearing on the effective use or operation of the supplies or services.
- A major nonconforming material is likely to result in failure of the supplies or services or to materially reduce the usability of the supplies or services for their intended purpose.
- A critical nonconforming material is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the supplies or services or is likely to prevent performance of a vital agency mission.

[8] DoD Regulation 7000.14-R, "DoD Financial Management Regulation," volume 13, chapter 1, states that appropriated funds are monies paid out of the U.S. Treasury pursuant to statutory authority granted by Congress to the DoD to incur obligations and make payments.

FAR 46.407, "Nonconforming Supplies or Services," states that a contracting officer:

- should reject supplies or services that do not conform to contract requirements in all respects,
- is allowed to accept nonconforming material if it is in the Government's best interest for reasons such as economy and urgency, and
- must obtain the advice of the technical activity to determine whether the item is safe to use and will perform its intended purpose prior to accepting nonconforming supplies or services.

Contractor Process for Generating Nonconforming Material Reports

GA-ASI established procedures for the control of nonconforming material in a document titled 2.PQA.003 Rev C, "Control of Nonconforming Material Procedure." According to the procedure, when GA-ASI personnel identify nonconforming material, they initiate a nonconforming material report in GA-ASI's electronic database.[9] A nonconforming material report describes why the material does not meet a quality assurance requirement. The report also includes recommendations for resolving the nonconforming material. GA-ASI personnel submit the nonconforming material report to Det 3 engineers through the electronic database for Government review and approval.

Government Process for Accepting Nonconforming Material Report Recommendations

According to the Det 3 Lead Engineer, Det 3 engineers access the GA-ASI electronic database to review nonconforming material reports and recommendations. These engineers determine the nonconforming material categories as minor, major, and critical. They also determine whether to accept or reject the contractor's recommendations for resolving minor nonconforming material.

The Det 3 Lead Engineer also stated that the Det 3 engineers refer all major or critical nonconforming material and any other nonconforming material reports outside of the Det 3 engineers' expertise to the SPO. The SPO determines whether to accept the contractor's recommendations for these referred nonconforming material. Det 3 engineers then record the SPO's decision to accept or reject the report recommendations in the GA-ASI electronic database.

[9] GA-ASI developed and maintained an electronic database that GA-ASI and the Air Force use as a routing system for coordination of nonconforming reports. GA-ASI refers to the reports as Quality Notifications.

Analysis of Nonconforming Material Acceptance

We obtained a GA-ASI summary report that identified 2 years of nonconforming material reports submitted to Det 3 for its review and approval. We then identified 541 nonconforming material reports that the Det 3 Lead Engineer accepted between November 2, 2015, and September 13, 2017. The Det 3 Lead Engineer categorized all 541 nonconforming material reports as minor and accepted all 541. We determined that 44 of the 541 nonconforming material reports involved parts that were listed on the Det 3 engineers' draft critical safety items list.[10, 11] We focused our evaluation on these 44 nonconforming material reports involving critical safety items because of the possibility of catastrophic damage or loss of the aircraft if the nonconforming materials were inappropriately accepted.

Det 3 Lead Engineer Appropriately Categorized Nonconforming Material

We interviewed the Det 3 Lead Engineer who told us that he categorized these 44 nonconforming material reports as minor. We reviewed GA-ASI's description of the nonconformance in each of the 44 nonconforming material reports. Within the 44 nonconforming material reports, GA-ASI personnel described instances of incorrectly drilled holes, air bubbles, wrinkles between layers of the composite material, or other workmanship errors. We determined that the 44 nonconforming material reports met the FAR 46.101 definition of minor nonconforming material. Specifically, we determined that none of the nonconforming material associated with the 44 reports significantly reduced the usability of the aircraft or component part or had little bearing on the effective use or operation of the aircraft. Therefore, we determined that the Det 3 Lead Engineer appropriately categorized these 44 nonconforming material reports as minor.

Det 3 Lead Engineer Appropriately Accepted Nonconforming Material

In each of the 44 nonconforming material reports, GA-ASI personnel proposed a nonconforming report recommendation. The recommendations included actions such as recommending that the Det 3 accept the part as it is, accept the part after GA-ASI patched damaged areas, or accept the part after GA-ASI performed other minor repairs. We reviewed the 44 nonconforming material report descriptions,

[10] Critical safety items include a part, assembly, or equipment for an aircraft or aviation weapons system that contains a characteristic such that any failure, malfunction, or absence could cause a catastrophic or critical failure resulting in the loss or serious damage to the aircraft or weapons system.

[11] See Finding C for analysis of the draft critical safety items list. We used a draft list because it was the only document that provided part numbers to facilitate our analysis.

recommendations, and supporting tests and analyses. The following are examples of the 44 nonconforming material reports we reviewed, GA-ASI's recommendations, the Det 3 Lead Engineer's decision, and our analysis of the nonconforming material.

- On March 8, 2016, GA-ASI sent a nonconforming material report to Det 3 engineers that identified a depression on a composite wing spar due to the use of lift clamps.[12] GA-ASI performed a stress analysis and provided the results as part of the nonconforming material report. GA-ASI recommended that Det 3 use the material as is. In addition, GA-ASI established a preventative maintenance process in order to avoid future depressions caused by the lift clamps. The Det 3 Lead Engineer accepted the recommendation and, as a result, accepted the material. We reviewed the supporting stress analysis and determined that the depression on the composite wing spar did not significantly impact the wing spar form. As a result, the wing spar would function as intended. Therefore, we agreed with the Det 3 Lead Engineer's decision to accept the composite wing spar.
- On April 20, 2016, GA-ASI sent a nonconforming material report to Det 3 engineers that identified a wing spar with a misdrilled hole. GA-ASI engineers performed a stress analysis and presented the results as a part of the nonconforming material report. GA-ASI recommended that Det 3 use the wing spar as is. In addition, GA-ASI stated they would retrain workers to verify drill bit dimensions were to engineering drawing and standard work instructions. The Det 3 engineer accepted the recommendation and, as a result, accepted the material. We reviewed the wing spar's destructive test results. We determined that the misdrilled hole did not affect the ability of the wing spar to operate as intended. Therefore, we agreed with the Det 3 Lead Engineer's decision to accept the wing spar.
- On October 8, 2016, GA-ASI sent a nonconforming material report to Det 3 engineers that identified a composite support plate that lacked the required amount of resin near the edge. GA-ASI performed an analysis and provided it in the nonconforming material report. GA-ASI recommended that Det 3 accept the composite support plate after GA-ASI performed a repair, which was to add resin in the area on the composite support plate that lacked the required amount of resin. The Det 3 Lead Engineer accepted GA-ASI's recommendation and, as a result, agreed to accept the material following the recommended repair. We reviewed the recommended repair and determined that the repair would provide adequate structural reinforcement. Therefore, we agreed with the Det 3 Lead Engineer's decision to accept the composite support plate.

[12] A wing spar is the main structural member of the wing that carries the flight loads and the weight of the wings while on the ground.

We performed a review similar to the examples above for each of the 44 nonconforming material reports. Based on our review, we agreed with GA-ASI's recommendations and the Det 3 Lead Engineer's decision to accept the nonconforming material. Therefore, we determined that the Det 3 Lead Engineer appropriately accepted the 44 recommendations and the material.

However, as discussed in Finding C, the SPO did not formally delegate authority to approve nonconforming material to the Det 3 Lead Engineer. Specifically, according to FAR 46.407, the cognizant contract administration office can accept or reject minor nonconforming material. The contracting officer allowed the Det 3 Lead Engineer to accept minor nonconforming material on their behalf. As a result, we concluded that the Det 3 Lead Engineer acted as the contract administration office. On May 23, 2018, the Contract Management Branch Chief told us that she had initiated actions to issue a delegation of authority memorandum.

Conclusion

We determined that the Det 3 Lead Engineer appropriately categorized 44 nonconforming material reports involving critical safety items as minor. We also determined that the Det 3 Lead Engineer used FAR 46.407 and appropriately accepted GA-ASI's recommendations for the 44 nonconforming material reports involving critical safety items. Therefore, we did not substantiate Allegation 1.

Finding B

The OL-Det 3 Conducted Acceptance Flight Tests Within the Acceptable Temperature Range

We reviewed MQ-9 Reaper flight test records for all 48 acceptance flight tests conducted between March 8, 2017, and October 17, 2017. We determined that OL-Det 3 personnel performed all 48 acceptance flight tests between 8:26 a.m. and 3:34 p.m. when outside air temperatures were within the range specified in the contract. Therefore, we did not substantiate the allegation that OL-Det 3 personnel performed flight tests early in the morning to prevent the aircraft from overheating and obtain favorable flight test results.

Allegation 2

OL-Det 3 personnel performed flight tests early in the morning to prevent the aircraft from overheating and obtain favorable flight test results.

Acceptance Flight Tests

OL-Det 3 and GA-ASI, in coordination, perform acceptance flight tests for the MQ-9 Reaper to verify proper aircraft assembly and operation. Ownership of the aircraft is transferred from the contractor to the Government upon successful flight testing and acceptance of the results by the Government.

The MQ-9 Reaper contract specifies the environmental conditions required for acceptance test flights. These environmental conditions include outside air temperature, wind, and precipitation. Specifically, the contract requires the acceptance flight tests to be performed within an outside air temperature range of 32 to 115 degrees Fahrenheit. The contract does not specify the time of day that OL-Det 3 and GA-ASI must perform an acceptance flight test.

Analysis of Acceptance Flight Test Times

OL-Det 3 personnel conducted 48 MQ-9 Reaper acceptance flight tests between March 8, 2017, and October 17, 2017. We reviewed the flight test records and determined that these 48 acceptance flight tests were performed in the morning and afternoon hours between 8:26 a.m. and 3:34 p.m.

Furthermore, we reviewed outside air temperatures for the 48 acceptance flight tests. The outside air temperatures for these flights ranged from 51 to 104 degrees Fahrenheit. This range was within the 32- to 115-degrees Fahrenheit range specified in the MQ-9 Reaper contract.

Conclusion

We determined that the OL-Det 3 personnel in coordination with GA-ASI personnel performed flight tests between 8:26 a.m. and 3:34 p.m. when outside air temperatures were within the range specified in the contract. Therefore, we did not substantiate Allegation 2 that acceptance flight tests were performed early in the morning to prevent the aircraft from overheating and obtain favorable flight test results.

Management Comments on the Finding and Our Response

System Program Office Comments

The Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces, responding for the SPO Senior Materiel Leader, stated that the MQ-9 flight test times in the draft report were in Greenwich Mean Time, not Pacific Standard Time. As a result, the flight test times included in the draft report did not accurately reflect the local flight test times.

Our Response

We updated the report to reflect local flight test times. This update did not affect our conclusion that flight tests were performed when air temperatures were within the range specified in the contract.

Finding C

SPO Did Not Have an Adequate Delegation of Authority Memorandum and a Critical Safety Items List

We determined the SPO did not have two key documents. First, the SPO did not issue an official memorandum to delegate Det 3 engineers authority to accept nonconforming material, as required by Air Force Materiel Command Instruction 63-1201, "Implementing Operational Safety, Suitability and Effectiveness and Life Cycle Systems Engineering," March 28, 2017. Without an official delegation of authority memorandum, the Det 3 engineers could misunderstand or potentially abuse their specific roles, responsibilities, and authorities, which could result in the inappropriate acceptance of major or critical nonconforming material.

Second, the SPO did not develop a comprehensive critical safety items list that complied with Air Force Instruction 20-106, "Management of Aviation Critical Safety Items," January 25, 2006. Specifically, the SPO provided lists of critical safety items that did not identify the prime contractor, the original equipment manufacturer, or alternate sources of manufacture, supply, or repair for each of the critical safety items. The information is required by Air Force Instruction 20-106. Without a critical safety items list meeting the requirements of Air Force Instruction 20-106, the Det 3 engineers could overlook critical safety item criteria leading to inappropriate acceptance of nonconforming material.

The SPO Did Not Issue Official Memorandums to Delegate Authority

During our evaluation, the Det 3 Lead Engineer told us that he and two other Det 3 engineers accept or reject nonconforming material in the GA-ASI electronic database on behalf of the SPO. FAR 46.407 and AFMCI 63-1201 address delegation of program management responsibilities.

According to FAR 46.407, the contracting officer is allowed to accept critical, major, or minor nonconforming material if it is in the Government's best interest for reasons such as economy and urgency. Further, it states that:

> if the [nonconforming material] is minor, the cognizant contract administration office may make the determination to accept or reject [the nonconforming material].

We concluded that the Det 3 Lead Engineer and two other Det 3 engineers acted as the contract administration office, as described by FAR 46.407, because they independently approved the acceptance of minor nonconforming material. For example, we identified 541 minor nonconforming material reports that the Det 3 Lead Engineer accepted between November 2, 2015, and September 13, 2017.

According to the Air Force Materiel Command Instruction 63-1201:

> delegation of program management or engineering/technical responsibilities and authorities to a qualified individual is specific in nature, documented by official memo, and regularly reviewed/updated over time.

The MQ-9 Reaper Materiel Leader and Det 3 Deputy Commander could not provide an official memorandum that granted Det 3 engineers authority to act as a contract administration office and accept nonconforming material on behalf of the SPO. As a result, we determined that the SPO did not issue official memorandums to delegate this authority. The SPO Contract Management Branch Chief speculated that the SPO may not have issued an official delegation memorandum because Det 3 engineers are considered an extension of the SPO. However, we do not agree with that rationale for the following reasons.

- FAR 46.407 states that the contracting officer is allowed to accept nonconforming material. The Det 3 engineers were not contracting officers.
- FAR 46.407 states that the contract administrative office may accept minor nonconforming material. The Det 3 engineers accepted minor nonconforming material on behalf of the contracting officer and therefore acted as the contract administration office.
- Air Force Materiel Command Instruction 63-1201 states that the delegation of program management and technical responsibilities must be documented in an official memorandum. The Det 3 engineers performed responsibilities on behalf the contracting officer when the engineers accepted nonconforming material.

For these reasons, we believe the SPO Senior Materiel Leader should issue an official memorandum to delegate to Det 3 engineers the authority to accept nonconforming material. On May 23, 2018, the SPO Contract Management Branch Chief told us that she had initiated actions to issue an official delegation of authority memorandum to the Det 3 engineers.

The SPO Did Not Have a Comprehensive Critical Safety Items List

Defense Federal Acquisition Regulation Supplement 209.270-4(a)(1), "Aviation and ship critical safety items," requires the head of a design control activity to identify critical safety items. Air Force Instruction 20-106 defines a critical safety item as:

> a part, assembly, installation equipment, launch equipment, recovery equipment or support equipment for an aircraft or aviation weapons system that contains a characteristic for which any failure, malfunction or absence could cause a catastrophic or critical failure resulting in the loss or serious damage to the aircraft or weapons system; an unacceptable risk of personal injury or loss of life; or an uncommanded engine shutdown that jeopardizes safety.

Further, Air Force Instruction 20-106 states that the assigned engineering support activity is responsible for:

> developing, maintaining, and distributing or providing access to a current listing of [critical safety items], which includes identification of prime contractors, [original equipment manufacturers] and alternate sources of manufacture, supply, or repair/overhaul for each [critical safety item].

While evaluating the allegations, we requested the MQ-9 Reaper critical safety items list. GA-ASI and Det 3 engineers provided us three different critical safety items lists in response to our request. Two of the lists were draft documents that had not been approved by the SPO or GA-ASI. These draft lists did not identify the prime contractor, the original equipment manufacturer, alternate sources of manufacture, supply, or repair for each of the critical safety items, as required by Air Force Instruction 20-106.

The third critical safety items list was approved by GA-ASI personnel and identified critical safety items part descriptions and additional information, such as critical characteristics.[13] However, this list did not identify the prime contractor, the original equipment manufacturer, alternate sources of manufacture, supply, or repair for each of the critical safety items, as required by Air Force Instruction 20-106. As a result, we determined these critical safety items lists were not comprehensive.

[13] Air Force Instruction 20-106 does not identify who should approve the critical safety items list.

When we asked the MQ-9 Reaper Materiel Leader why the critical safety items lists were not comprehensive, he told us that the SPO tracks the elements identified in the Air Force Instruction 20-106 for each of the critical safety items. However, he stated that the SPO had not developed a critical safety items list that identified these elements, as required by Air Force Instruction 20-106.

A comprehensive critical safety items list would ensure that the SPO appropriately categorizes, identifies and tracks critical safety items that if nonconforming and inappropriately accepted could cause a catastrophic or critical failure resulting in the loss or serious damage to the aircraft or weapons system.

Conclusion

We determined the SPO did not have two key documents. First, we concluded that the SPO did not issue official memorandums to delegate authority to Det 3 personnel to accept nonconforming material on the SPO's behalf. Without an official delegation of authority memorandum, the Det 3 engineers could misunderstand or potentially abuse their specific roles, responsibilities, and authorities, which could result in the inappropriate acceptance of major or critical nonconforming material.

Second, the SPO did not have a comprehensive critical safety items list, as required by Air Force Instruction 20-106. Further, without a critical safety items list meeting the requirements of Air Force Instruction 20-106, the Det 3 engineers could overlook critical safety item criteria leading to inappropriate acceptance of nonconforming material.

Management Comments on the Finding and Our Response

System Program Office Comments

The Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces, responding for the SPO Senior Materiel Leader, stated that the SPO Contract Management Branch Chief agreed with the DoD OIG regarding the acceptance of nonconforming material. However, he stated that the statement made by the SPO Contract Management Branch Chief regarding why the SPO did not issue an official delegation memorandum was speculation and did not reflect the opinion of the SPO Contract Management Branch Chief.

Our Response

We updated the report to reflect that the statement made by the SPO Contract Management Branch Chief regarding why an official delegation memorandum was not issued was speculation. This update did not affect our conclusion.

Recommendations, Management Comments, and Our Response

Recommendation C.1

We recommend that the MQ-9 Reaper System Program Office Senior Materiel Leader formally delegate to Detachment 3 engineers the authority to accept nonconforming material, as required by Air Force Materiel Command Instruction 63-1201.

System Program Office Comments

The Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces, responding for the SPO Senior Materiel Leader, agreed and stated that the SPO Chief Engineer, Senior Materiel Leader, and Contract Management Branch Chief will formally delegate any applicable authorities to the Det 3 Chief Engineer no later than August 2018.

Our Response

Comments from the Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces adequately addressed the recommendation, and no further comments are required. Therefore, this recommendation is resolved, but remains open. We will close this recommendation once we verify that the SPO Senior Materiel Leader issued the formal delegation of authority memorandum, as recommended. We expect receipt no later than September 30, 2018.

Recommendation C.2

We recommend that the MQ-9 Reaper System Program Office Senior Materiel Leader develop and approve a comprehensive critical safety items list, as required by Air Force Instruction 20-106.

System Program Office Comments

The Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces, responding for the SPO Senior Materiel Leader, agreed and stated that the SPO will formalize the critical safety items list no later than September 30, 2018, and will incorporate the list into all applicable contracts that contain the clause DFARS 252.2090-7010.

Our Response

Comments from the Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces addressed all specifics of the recommendation, and no further comments are required. Therefore, this recommendation is resolved, but remains open. We will close this recommendation once the SPO provides evidence to the DoD OIG that a comprehensive safety items list was developed as recommended. We expect receipt no later than October 31, 2018.

Finding D

MQ-9 Reaper Class A Mishap Rate Was Consistent With Other Unmanned Aircraft Vehicles

We determined that the MQ-9 Reaper average lifetime Class A mishap rate was consistent with a similar unmanned aircraft vehicle, the Q-4 Global Hawk. We also determined that the MQ-9 Reaper average lifetime Class A mishap rate had significantly improved from its predecessor, the MQ-1 Predator.

Mishap Rate

According to DoD Instruction 6055.07, "Mishap Notification, Investigation, Reporting, and Record Keeping," June 6, 2011, defines a mishap as:

> an unplanned event or series of events that results in damage to DoD property; occupational illness to DoD personnel; injury to on- or off-duty DoD military personnel; injury to on-duty DoD civilian personnel; or damage to public or private property, or injury or illness to non-DoD personnel, caused by DoD activities.

Further, the DoD Instruction 6055.07 states mishaps are categorized into classes based on factors such as personnel injury, cost of damage, and loss of the aircraft.

- Class A mishaps are the most serious, with loss of life or permanent disability, and damages in excess of $2 million, or total loss of the aircraft.
- Class B mishaps result in total cost of damages to Government and other property of $500,000 or more, but less than $2 million.
- Class C mishaps result in total cost of property damages to Government and other property of $50,000 or more, but less than $500,000.

The mishap rate of an aircraft is a ratio of the number of mishaps per 100,000 flight hours. Our evaluation focused on Class A mishaps because these mishaps were the most impactful to the Air Force. We compared MQ-9 Reaper Class A mishaps to other similar unmanned aircraft vehicles.

DoD Instruction 6055.07 groups unmanned aircraft vehicles according to aircraft weight and operating altitude. MQ-9 Reaper is a Group 5 unmanned aircraft vehicle because it weighs more than 1,320 pounds and normally operates at an altitude above 18,000 feet. We compared the MQ-9 Reaper Class A mishap rate to the Class A mishap rates for the other Group 5 unmanned aircraft vehicles used by the Air Force, the Q-4 Global Hawk and the MQ-1 Predator.[14]

[14] GA-ASI manufactured the MQ-1 Predator. Northrop Grumman manufactures the Q-4 Global Hawk.

U.S Air Force Safety Center Flight Mishap History Reports

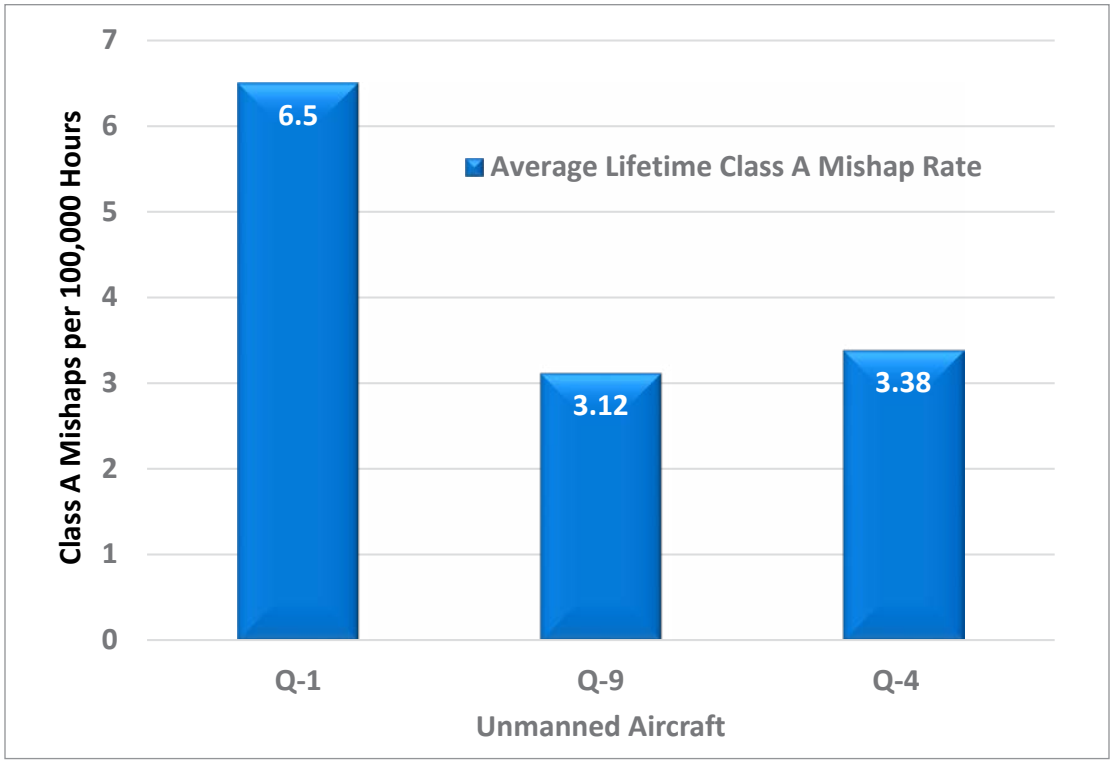
The U.S. Air Force Safety Center, located at Kirtland Air Force Base, New Mexico, tracks mishap safety data. We obtained the November 6, 2017, MQ-9 Reaper, Q-4 Global Hawk, and MQ-1 Predator Class A "Flight Mishap History" reports from the U.S. Air Force Safety Center. These reports identified the average lifetime Class A mishap rate for each of the three Group 5 unmanned aircraft vehicles. We compared the MQ-9 Reaper to the Q-4 Global Hawk and MQ-1 Predator to determine whether the MQ-9 Class A mishap rate was consistent with other Group 5 unmanned aircraft vehicles.

We determined that the MQ-9 Reaper and Q-4 Global Hawk had approximately the same average lifetime Class A mishap rate. Further, the MQ-9 Reaper experienced less than half the rate of Class A mishaps as its predecessor, the MQ-1 Predator. Specifically, the

- MQ-9 Reaper had 3.12 Class A mishaps per 100,000 flight hours,
- Q-4 Global Hawk had 3.38 Class A mishaps per 100,000 flight hours, and
- MQ-1 Predator had 6.5 Class A mishaps per 100,000 flight hours.

Figure 2 depicts the average lifetime Class A mishap rates for the three unmanned aircraft vehicles.

Figure 2. Group 5 Unmanned Aircraft – Lifetime Class A Mishap Rates (As of November 6, 2017)



Source: U.S. Air Force Safety Center data.

Conclusion

We determined the MQ-9 Reaper average lifetime Class A mishap rate was consistent with a similar unmanned aircraft vehicle. We also determined the MQ-9 Reaper average lifetime Class A mishap rate had significantly improved from its predecessor, the MQ-1 Predator.

Appendix

Scope and Methodology

We conducted this evaluation from August 2017 through June 2018 in accordance with the "Quality Standards for Inspection and Evaluation," published in January 2012 by the Council of Inspectors General on Integrity and Efficiency. Those standards require that we adequately planned the evaluation to ensure that objectives were met and that we performed the evaluation to obtain sufficient, competent, and relevant evidence to support the findings, conclusions, and recommendations. We believe that the evidence obtained was sufficient, competent, and relevant to allow a reasonable person to sustain the findings, conclusions, and recommendations.

~~(FOUO)~~ We performed this evaluation at GA-ASI manufacturing facility in Poway, California, and at the GA-ASI flight test facility [redacted]. We interviewed personnel onsite from the following organizations:

- MQ-9 Reaper System Program Office,
- MQ-9 Reaper System Program Office, Detachment 3,
- Defense Contract Management Agency, and
- General Atomics Aeronautical Systems, Incorporated.

Specifically, we identified their roles and responsibilities in the acceptance of GA-ASI's recommendations for nonconforming material. We collected, sampled, reviewed, and analyzed records associated with classification and recommendations for nonconforming material for the MQ-9 Reaper program. We compared the compiled results of records review, personnel interviews, and documentation review.

We reviewed the following Federal, DoD, and Department of the Air Force guidance:

- FAR Part 46, "Quality Assurance"
- Defense Federal Acquisition Regulation Supplement Subpart 209.2, "Qualifications Requirements"
- DoD Instruction 6055.07, "Mishap Notification, Investigation, Reporting, and Record Keeping," June 6, 2011
- Air Force Instruction 20-106, "Management of Aviation Critical Safety Items," January 25, 2006
- Air Force Materiel Command Instruction 63-1201, "Implementing Operational Safety Suitability and Effectiveness (OSS&E) and Life Cycle Systems Engineering (LCSE)," March 28, 2017

Use of Computer-Processed Data

We used computer-processed data to perform this evaluation. We extracted a summary of nonconforming material reports contained in a contractor-owned electronic database. Using Excel, we sorted and filtered the reports to identify nonconforming material reports. We reviewed each sampled nonconforming material report with the Det 3 Lead Engineer and we determined this data were reliable.

Use of Technical Assistance

We used the assistance of subject matter experts with extensive experience in quality assurance, aircraft manufacturing, and control of nonconforming material.

Prior Coverage

During the last 5 years, the DoD Office of Inspector General and the Air Force Audit Agency issued two reports related to the MQ-9 Reaper program. Unrestricted DoD Office of Inspector General reports can be accessed at http://www.dodig.mil/reports.html/. Unrestricted Air Force Audit Agency reports can be accessed from https://www.efoia.af.mil/palMain.aspx by clicking on Freedom of Information Act Reading Room and then selecting audit reports.

DoD Office of Inspector General

Report No. DODIG-2014-123, "Air Force Did Not Justify the Need for MQ-9 Reaper Procurement Quantities," September 30, 2014

> This audit determined that the Air Force did not justify the need for the planned procurement quantity of 401 MQ-9 aircraft, at an estimated cost of $76.8 billion. As a result, the Air Force risked spending approximately $8.8 billion to purchase, operate, and maintain 46 MQ-9 aircraft it may not need.

Air Force Audit Agency

Report No. F2014-0001-L30000, "MQ-1 Predator and MQ-9 Reaper Ground Control Stations," November 8, 2013

> This audit determined that Air Force personnel did not adequately manage technical system requirements for the Block 30 Ground Control Station upgrade or accurately establish Block 50 Ground Control Station budget requirements.

Management Comments

Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces

DEPARTMENT OF THE AIR FORCE
AIR FORCE LIFE CYCLE MANAGEMENT CENTER
WRIGHT-PATTERSON AIR FORCE BASE OHIO

JUL 16 2018

MEMORANDUM FOR DOD INSPECTOR GENERAL

FROM: AFLCMC/WI

SUBJECT: Department of Defense Inspector General (DODIG) Draft Report, 22 Jun 18, Hotline Allegations Regarding Acceptance and Testing of the MQ-9 Reaper Aircraft, Project D2017-D000PT-0174)

1. We concur with the DODIG Recommendations made in the DODIG Draft Report, Project D2017-D000PT-0174. Specific management comments in response to the report and recommendations are attached.

2. If you have questions or concerns, please contact [redacted].

MARTIN J. O'GRADY, Colonel, USAF
Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces

Attachment:
Management Comments

Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces (cont'd)

Final Report Reference

Reference: (a) Department of Defense Inspector General Project No. D2017-D000PT-0174.000, "Hotline Allegations and Testing of the MQ-9 Reaper Aircraft, dated 22 Jun 2018

1. The referenced document contains a several misstatements that should be clarified.
   a. Throughout the document, request the term Program Management Office, (PMO) be updated to System Program Office (SPO).
   b. Flight times referenced in the draft report are provided in GMT, not local times as indicated in the document. Adjusting for local times will shift the flight window from approximately 1500-2200 to 0800-1500 local. The temperatures cited in the report are still accurate.
   c. Page 11 the following sentence appears, "The PMO Contract Management Branch Chief stated that the PMO did not issue an official delegation memorandum because Det 3 engineers are an extension of the PMO and therefore she did not believe they required a delegation memorandum". The SPO Contract Management Branch Chief agrees with the DoDIG regarding FAR 46.407 and acceptance of non-conforming material. The comment in question was speculation as to why a delegation may not have been provided previously, but does not reflect the opinion of the SPO Contract Management Branch Chief.
   d. Pages 19-20, Prior Coverage Section, both referenced reports have been closed and the findings were not substantiated. As written, the excerpts, while correctly quoted, are misleading as to the final outcome.
      1) Closure Memorandum DODIG-2014-123, "Air Force Did Not Justify the Need for MQ-9 Reaper Procurement Quantities," dated March 28, 2018, states "For recommendation 1.a, Air Force personnel provided the Office of Inspector General a presentation of the model used to analyze the quantity of aircraft, and we agree that the analysis met the intent of the recommendation. Although the Air Force did not fully meet the intent of recommendations 1.b and 2, we are closing the recommendations based on our meeting where it was explained that the MQ-9 program is dynamic and the final number of aircraft has not yet been determined."
      ((Recommendation 1a: [ACC] Perform and document comprehensive analyses to determine the necessary quantity of MQ-9 aircraft. Recommendation 1b: Based on the results of Recommendation 1.a., update and submit the MQ-9 production document to the Air Force Requirements Oversight Council and subsequently, the Joint Requirements Oversight Council, and request validation that the cost and quantity changes are necessary prior to making any FY 2015 procurement decisions. Recommendation 2: Chairman of the Air Force Requirements Oversight Council validate the necessary quantity and cost in the updated MQ-9 production document prior to providing the updated production document to the Joint Requirements Oversight Council for revalidation.)

      2) Closure Memorandum, Close-Out Audit, Unmanned Aerial Systems Ground Stations (Project F2017-L30000-0009.000), dated 2 November 2017, states " In response to the prior audit report, Air Force personnel implemented corrective actions to improve the tracking of technical requirements of the Block 50 GCS. We are terminating the audit at this time because the initial production of the Block 50 GCS was delayed in order to meet a new single Operational Flight Program requirement. Therefore, we could not fully verify that management corrective actions were effective in specifically eliminating the conditions as related to the Block 50 GCS."

Revised

Program Executive Officer for Intelligence, Surveillance, Reconnaissance, and Special Operations Forces (cont'd)

Final Report Reference

2. Areas of redaction. In order to release the document without "For Official Use Only" markings, as specified on page 1 of the report, the following redactions must be made in accordance with the Freedom of Information Act, Exemption 3:

   a. Page i, Column 2, top of page: [redacted]

   b. Report Page 2, last sentence: [redacted]

   c. Appendix Page 18, para 2, line 2. [redacted]

~~(FOUO)~~

3. The SPO provides the following responses to the draft report as requested by the DoDIG:

   a. **DODIG Recommendation C.1: We recommend that the MQ-9 Reaper Program Management Office Senior Materiel Leader formally delegate to Detachment 3 engineers the authority to accept nonconforming material, as required by Air Force Command Instruction 63-1201.**

   SPO Response: The SPO Chief Engineer, Senior Material Leader, and Contract Management Branch Chief will formally delegate any applicable authorities to the Det 3 Chief Engineer no later than August 2018.

   b. **DODIG Recommendation C.2: We recommend that the MQ-9 Reaper Program Management Office Senior Materiel Leader develop and approve a comprehensive critical safety items list, as required by Air Force Instruction 20-106.**

   SPO Response: The SPO will formalize a Critical Safety Items list no later than 30 Sep 18, which will be incorporated into the all applicable contracts that contain the clause DFARS 252.209-7010, "Critical Safety Items".

Acronyms and Abbreviations

AFLCMC/WII	Air Force Life Cycle Management Center, Medium Altitude Unmanned Aircraft Systems Division
Det 3	Detachment 3
FAR	Federal Acquisition Regulation
GA-ASI	General Atomics Aeronautical Systems, Incorporated
OL-Det 3	Operating Location-Detachment 3
SPO	System Program Office

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U.S. Department of Defense

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