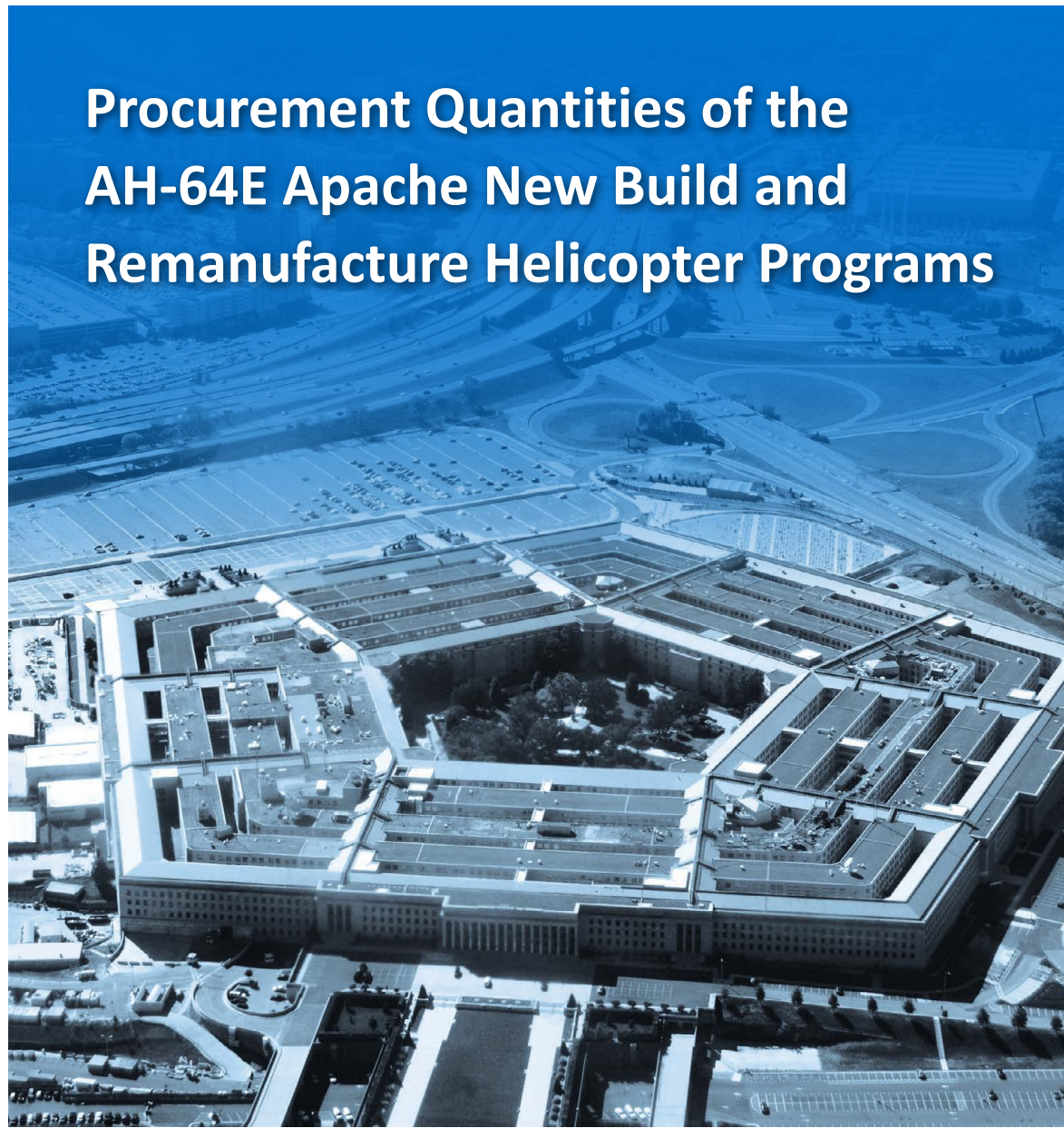




INSPECTOR GENERAL

U.S. Department of Defense

JUNE 25, 2018



Procurement Quantities of the AH-64E Apache New Build and Remanufacture Helicopter Programs

INTEGRITY ★ INDEPENDENCE ★ EXCELLENCE





Results in Brief

Procurement Quantities of the AH-64E Apache New Build and Remanufacture Helicopter Programs

June 25, 2018

Objective

We determined whether the Army justified procurement quantities for the AH-64E Apache new build and remanufacture helicopter programs. We consider the quantity justified when the analysis and rationale for procurement decisions are documented and show that the quantity meets warfighter needs and complies with Army guidance regarding procurement quantity.

Background

The AH-64E Apache is an Army two-pilot, four-blade attack and reconnaissance helicopter. The Apache fleet consists of two models, the AH-64D and AH-64E; however, the Army plans to replace the AH-64D with the AH-64E. The AH-64E program consists of two Major Defense Acquisition Programs—one Major Defense Acquisition Program for remanufactured AH-64Es and one for new build AH-64Es. The remanufacturing program upgrades an existing AH-64D to the AH-64E model, while the new build program produces an AH-64E with all new parts.

The five offices that share responsibility for determining the correct required quantities for the AH-64E Apache Program are the Deputy Chief of Staff of the Army, G-8 (Resource Management); the Deputy Chief of Staff of the Army, G-3/5/7 (Operations, Plans, and Training); the Deputy Chief of Staff of the Army, G-4 (Logistics); the Training and Doctrine Command; and the Apache Program Office.

The Army procures quantities of equipment according to its acquisition objective. The AH-64E acquisition objective is broken down into four sub-categories: operating, training, float, and test. The Army uses float helicopters to provide a temporary replacement when AH-64Es need maintenance, modification, or repair.

Finding

G-8 and G-3/5/7 officials justified planned procurement quantities of the AH-64Es designated for regular Army and Army National Guard operational fleets. However, G-8, G-3/5/7, and G-4 officials could not justify the planned procurement quantities of 85 training, 67 float, and 15 test AH-64Es. This occurred because G-8, G-3/5/7, and G-4 officials did not conduct the analyses required by DoD and Army guidance to determine the necessary training, float, and test quantities before the Deputy Chief of Staff of the Army, G-8, approved the Army Acquisition Objective on June 15, 2017. As a result, G-8 officials cannot ensure that 167 AH-64Es for training, float, and test, valued at \$3.5 billion, will meet the needs of the Army. Additionally, G-8 officials have no assurance that the AH-64E program is affordable. If too many AH-64Es are procured, the Army could be wasting DoD funds that could be put to better use. If too few AH-64Es are procured, the Army may not be able to train enough pilots to meet Army operational needs, provide replacements for AH-64Es that cannot be repaired in time to meet readiness objectives, or test and evaluate other weapon systems that are added to the AH-64E.

Recommendations

We recommend that the Deputy Chief of Staff of the Army, G-8:

- review and validate that G-3/5/7 and G-4 officials can justify the training, float, and test quantities of AH-64Es before approving;
- prepare and retain supporting documentation for decisions to approve the Army Acquisition Objective; and
- coordinate with G-3/5/7 officials to assess affordability and ensure that the planned procurement quantity is a sustainable investment decision.

We recommend that the Deputy Chief of Staff of the Army, G-3/5/7:

- coordinate with U.S. Army Aviation Center of Excellence and the Apache Program Office to determine the necessary AH-64E training and test quantities;
- analyze the supportability, affordability, and feasibility of AH-64Es to determine the necessary training and test quantities and submit changes to G-8 for approval; and



Results in Brief

Procurement Quantities of the AH-64E Apache New Build and Remanufacture Helicopter Programs

Recommendations (cont'd)

- review and approve the float quantities determined by the G-4 officials to ensure that they are based on mission needs.

We recommend that the Deputy Chief of Staff of the Army, G-4:

- analyze and determine the AH-64E quantity necessary for float and submit to G-3/5/7 and G-8 officials for approval; and
- review and determine whether the float calculations in Army Regulation 750-1 should be updated.

Management Comments and Our Response

The Vice Chief of Staff of the Army, responding for the Deputy Chiefs of Staff of the Army, G-8, G-3/5/7, and G-4, agreed with all of the recommendations and stated that the Army:

- conducted a review of Army Acquisition Objective regulations and policies and has updated the methodology to determine the Army Acquisition Objective;
- developed simplified demand-based formulas to determine the number of AH-64Es necessary for training, Operational Readiness Float and Repair Cycle Float; and
- determined a baseline quantity of AH-64Es required to support the test fleet, which will be adjusted during the annual revalidation of the Army Acquisition Objective.

In addition, the Vice Chief of Staff of the Army stated that the Army plans to:

- publish a policy letter requiring annual revalidation of Army Acquisition Objective documents;
- capture revalidation results in a written execution order that documents the G-8, G-3/5/7, and G-4 analysis; and
- ensure that affordability assessments of planned procurement quantities are sustainable based on future budget expectations.

However, the Vice Chief of Staff of the Army did not specify how the Army will conduct and review its analysis to ensure that AH-64E quantities for training, float, and test will meet the needs of the Army. Further, the Vice Chief of Staff of the Army partially addressed our recommendation that G-8, G-3/5/7, and G-4 officials prepare and retain supporting documentation for decisions to approve the Army Acquisition Objective, but did not specify that supporting documentation would be retained.

In addition, on May 14, 2018, the G-8 revised the Army Acquisition Objective and determined that the planned procurement quantity for AH-64Es is 188 (100 for training, 81 for float, and 7 for test). However, the Vice Chief of Staff of the Army did not provide any analysis to support that the planned procurement quantity reflects the Army's actual needs for training, float, and test fleets across the program's life cycle. Therefore, nine recommendations remain unresolved.

In addition, the Vice Chief of Staff of the Army agreed to update the float calculations in Army regulations. Therefore, the recommendation to update the regulation is resolved but will remain open until we verify that Army Regulation 750-1 has been updated with the new formulas.

Please see the Recommendations Table on the next page.

Recommendations Table

Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
Deputy Chief of Staff of the Army, G-8	1.a, 1.b, 1.c	1.d	None
Deputy Chief of Staff of the Army, G-3/5/7	2.a, 2.b, 2.c, 2.d	None	None
Deputy Chief of Staff of the Army, G-4	3.a, 3.b	3.c	None

Please provide Management Comments by July 25, 2018.

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.





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

June 25, 2018

MEMORANDUM FOR DEPUTY CHIEF OF STAFF OF THE ARMY, G-8
DEPUTY CHIEF OF STAFF OF THE ARMY, G-3/5/7
DEPUTY CHIEF OF STAFF OF THE ARMY, G-4
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Procurement Quantities of the AH-64E Apache New Build and Remanufacture
Helicopter Programs (Report No. DODIG-2018-130)

We are providing this report for review and comment. We conducted this audit in accordance with generally accepted government auditing standards.

We considered the Vice Chief of Staff of the Army comments when preparing the final report. DoD instruction 7650.03 requires that recommendations be resolved promptly. Comments from the Vice Chief of Staff of the Army partially addressed the recommendations and did not address specifics of the recommendations. Therefore, we request additional comments on Recommendations 1.a, 1.b, 1.c, 2.a, 2.b, 2.c, 2.d, 3.a, and 3.b by July 25, 2018 that include specific actions the Army will take and support for actions taken.

Please send a PDF file containing your comments on the recommendations and public release review to audacs@dodig.mil. If you arrange to send classified comments electronically, you must send them over the SECRET Internet Protocol Router Network (SIPRNET). Copies of your comments must have the actual signature of the authorizing official for your organization.

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

A handwritten signature in black ink, appearing to read "Theresa S. Hull".

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

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Acronyms and Abbreviations

Introduction

Objective

We determined whether the Army justified procurement quantities for the AH-64E Apache new build and remanufacture helicopter programs.¹ See the Appendix for the audit scope, methodology, and prior audit coverage related to the audit objective.

Background

Apache Program

The Apache is a two-pilot, four-blade attack and reconnaissance Army helicopter. The Apache fleet consists of two models, the AH-64D and the AH-64E; however, the Army plans to replace the AH-64D with the AH-64E. The AH-64E has an upgraded engine; improved propulsion, targeting, and communications systems; and should reduce operations and maintenance activities and control unmanned aerial vehicles.



Figure 1. AH-64E Helicopter
Source: U.S. Army.

¹ The total Army has three essential components: the regular Army, the Army National Guard, and the Army Reserve. The regular Army consists of full-time soldiers. The Army National Guard and Army Reserve are comprised primarily of soldiers who serve part-time but can be ordered to full time duty. This report uses “the Army” instead of total Army.

The AH-64E program consists of one Major Defense Acquisition Program for remanufactured AH-64Es and another Major Defense Acquisition Program for new build AH-64Es.² Based on the FY 2017 Selected Acquisition Reports, total life-cycle costs over the 20-year operational life of the AH-64E are \$66.2 billion for the remanufactured AH-64Es and \$6.5 billion for new build AH-64Es.³

The Army plans to procure 767 AH-64Es to meet mission needs. As of March 2018, the Army had 233 AH-64Es and 503 AH-64Ds in the Apache fleet. The AH-64E remanufacture program will remanufacture all 503 existing AH-64Ds to the AH-64E model at a rate of approximately 50 per year. The AH-64E new build program will procure 31 additional AH-64Es to reach the total planned procurement quantity of 767 AH-64Es. The Army estimates it will complete the AH-64E remanufacture and new build programs in 2028. As of March 2018, the Army has accepted delivery of 216 remanufactured and 17 new build AH-64Es. Table 1 shows current and planned procurement quantities for the AH-64E.

Table 1. Current and Planned Procurement Quantities for the AH-64E

AH-64	Current Quantity	Future Procurement	Planned Quantity
AH-64D	503	0	0
AH-64E New Build	17	31	48
AH-64E Remanufactured	216	503	719
Totals	736	534	767

Source: The DoD OIG.

The Army procures AH-64E remanufactured and new build helicopters using the same contracts, builds them on the same production line, and delivers them in the same configuration, with the same capabilities. However, there is a difference in unit costs between the AH-64E remanufactured and new build helicopters because the remanufacturing program upgrades an existing AH-64D to the AH-64E model, while the new build program produces an AH-64E with all new parts. The Army does not distinguish between fielded remanufactured and new build AH-64Es. Therefore, we calculated a weighted average to determine unit cost because we were unable to associate a specific unit cost to a specific fielded AH-64E. Table 2 shows the AH-64E planned procurement quantities and unit costs.

² A Major Defense Acquisition Program is an acquisition program that is designated by the Under Secretary of Defense for Acquisition and Sustainment, or has an estimated total cost of more than \$480 million for research, development, test, and evaluation or \$2.79 billion for procurement.

³ A Selected Acquisition Report is a status report that includes quantity, cost, schedule, and performance information.

Table 2. AH-64E Total Planned Quantity and Unit Costs

AH-64	Planned Quantity	Average Procurement Unit Cost (in millions) ¹
AH-64E New Build	48	\$33.6
AH-64E Remanufactured	719	20.2
Totals	767	\$21.0²

¹ Average Procurement Unit Cost includes costs for procurement but excludes cost for research, development, testing and evaluation, and operations and sustainment.

² See the Appendix for an explanation of the calculation of the weighted average unit cost.

Source: The DoD OIG.

Roles for Determining AH-64E Procurement Quantities

Deputy Chief of Staff of the Army, G-8 (Resource Management)

The G-8 is the Army's lead for planning, developing, and funding for programs to balance current Army needs with future Army needs. The G-8 conducts the Army's affordability analysis and is responsible for reviewing and approving requested quantity changes that are received from the G-3/5/7 and the G-4.⁴ If the changes are approved, the G-8 generates and approves a new Army Acquisition Objective (AAO) that reflects the updated changes to quantity. The AAO is the total quantity required to meet the Army's mission needs, regardless of any financial constraints. Further, the G-8 ensures that other Army organizations, such as the G-3/5/7 and G-4, review and analyze the proposed quantity change in the AAO.

Deputy Chief of Staff of the Army, G-3/5/7 (Operations, Plans, and Training)

The G-3/5/7 develops warfighting capabilities, Army policy, and procedural guidance for combat development programs. Specifically, the G-3/5/7:

- submits AAO quantity recommendations to the G-8 for approval for operations, training, float, and test;
- conducts analyses to assess supportability and affordability for manpower, equipment, fiscal resources, facilities, and training across the entire program;
- oversees the U.S. Army Training and Doctrine Command, which determines the mission need for the Apache training quantity; and
- approves all float requirements from the G-4.

⁴ The affordability analysis addresses the total life-cycle cost of the planned program (including new and upgraded systems), identifies major cost drivers, and dictates cost limitations. An affordability analysis is a tool to promote responsible and sustainable investment decisions based on reasonable projections of future force structure and equipment needs, to avoid continuing programs that cannot be supported within reasonable expectations of future budgets.

Deputy Chief of Staff of the Army, G-4 (Logistics)

The G-4 provides and oversees integrated logistics policies, programs, and plans in support of sustainable Army readiness. The G-4 assesses quantities for the Repair Cycle Float (RCF) and the Operational Readiness Float (ORF). The RCF provides AH-64Es to temporarily replace helicopters turned in for scheduled depot repairs. ORF helicopters temporarily replace those AH-64Es that cannot be repaired in time to meet maintenance readiness objectives. If a quantity change is required in the RCF or the ORF, the G-4 must send the G-3/5/7 and G-8 a request for review and approval of the requested change.

U.S. Army Aviation Center of Excellence

U.S. Army Aviation Center of Excellence is a component of the U.S. Army Training and Doctrine Command that trains all regular Army and Army National Guard (ARNG) pilots. U.S. Army Aviation Center of Excellence activities include preparing aircraft for training, managing maintenance contracts for the training fleet, and scheduling classes for individual pilots. U.S. Army Training and Doctrine Command is responsible for calculating AH-64E training quantities and forwarding recommendations to the G-3/5/7 for review and approval.

Apache Program Office

The Apache Program Office is responsible for the AH-64E remanufacture and new build programs throughout the helicopter's life cycle. The Apache Program Office also manages a fleet of Apaches used to conduct developmental and operational testing.

Changes to AH-64E Procurement Quantities

The Army approved a procurement quantity of 690 AH-64Es in December 2010 and reapproved the same quantity in the FY 2013 AH-64E acquisition program baselines for the new build and remanufacture programs.⁵ In 2013, the Army developed and implemented the Aviation Restructure Initiative in response to the Budget Control Act of 2011. Congress enacted the Budget Control Act of 2011 to raise the debt ceiling and limit discretionary spending; the Act was accompanied by across-the-board cuts in both defense and non-defense spending. According to G-3/5/7 officials, these budget cuts reduced the Army aviation portfolio by approximately \$4 billion. The Aviation Restructure Initiative did not change the planned procurement quantity of 690 AH-64Es, but required transferring all ARNG Apaches (120 total) to the regular Army.

⁵ An acquisition program baseline describes a program's approved quantity, cost, schedule, and performance requirements. The AH-64E new build and AH-64E remanufacture programs have separate acquisition program baselines for a total procurement quantity of 690.

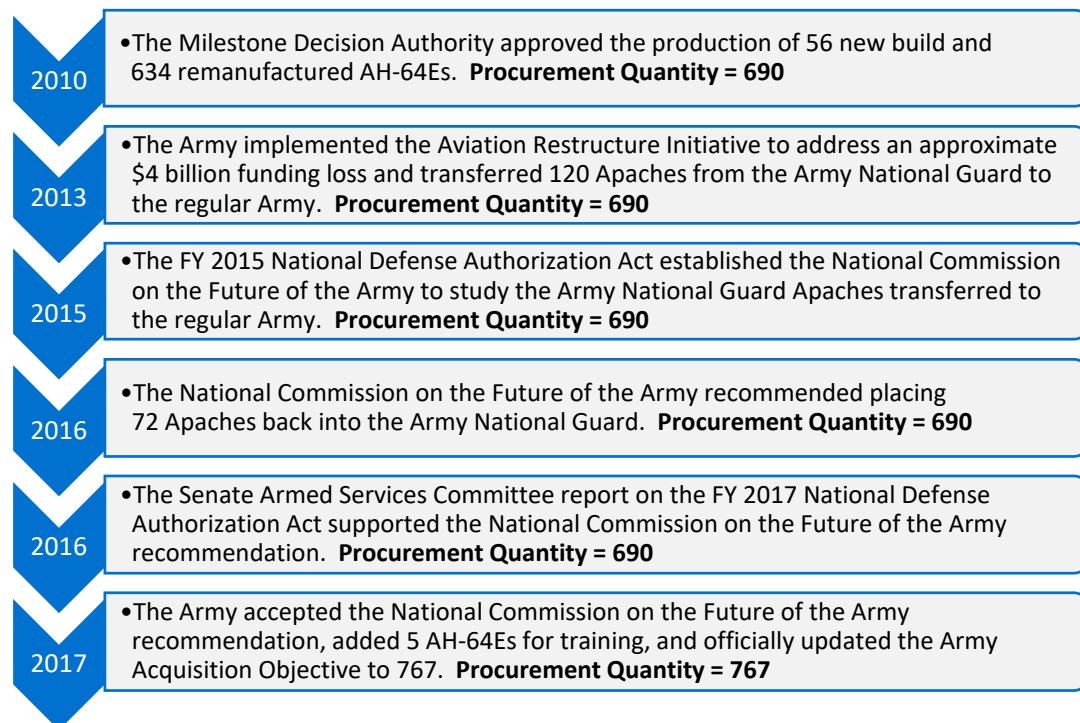
On December 19, 2014, the National Defense Authorization Act for FY 2015 established the National Commission on the Future of the Army (NCFA).⁶ Congress created the commission to:

- perform a comprehensive study of the Army structure;
- assess the size and force mix of the regular Army, the ARNG, and the Army Reserves; and
- address the proposal to transfer all Apaches from the ARNG to the regular Army.

The NCFA report, dated January 28, 2016, recommended to the President, Congress, and the Army that the ARNG acquire four Apache battalions, each equipped with 18 Apaches, for a total of 72 Apaches. In a committee report that accompanied the National Defense Authorization Act for FY 2017, the U.S. Senate Committee on Armed Services stated that it supported the NCFA recommendations.

As a result of the NCFA recommendations, the Army increased the AAO by 77 AH-64Es, thereby increasing the planned procurement quantity of AH-64Es from 690 to 767. The additional 77 AH-64Es consist of 72 AH-64Es for the ARNG and 5 AH-64Es for training. The Deputy Chief of Staff of the Army, G-8 (Resources Management), signed the AAO memorandum on June 15, 2017. Figure 2 shows the changes to the AH-64E planned procurement quantity from 2010 to 2017.

Figure 2. History of Apache Quantity



Source: The DoD OIG.

⁶ Public Law 113-291, "National Defense Authorization Act for Fiscal Year 2015," December 19, 2014.

Army Acquisition Objective Sub-Elements

The Army procures quantities of equipment according to the AAO. The AH-64E AAO that was approved in 2017 is composed of the following sub-elements for procurement quantities.

- **Operating:** The operating AH-64Es are the minimum essential quantities necessary to accomplish missions. The Army plans to procure and assign 600 AH-64Es for operating missions within the regular Army and ARNG.
- **Training:** The training AH-64Es are the quantities necessary and assignable to U.S. Army Aviation Center of Excellence for training, educating, and developing Army aviation professionals. The Army plans to procure and assign 85 AH-64Es for training.
- **Float:** The float AH-64Es are the quantities necessary to provide a temporary replacement when Apaches need maintenance, modification, or repair. The Army plans to procure and assign 67 AH-64Es for float.
- **Test:** The test AH-64Es are the quantities necessary for testing and evaluating other weapon systems that will be added to the AH-64E, such as the Hellfire and Joint Air-to-Ground missiles. The Army plans to procure and assign 15 AH-64Es for test.

Review of Internal Controls

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.⁷

We identified internal control weaknesses with the processes Army officials used to determine AH-64E procurement quantities for training, float, and test. Specifically, G-8, G-3/5/7, and G-4 officials did not conduct the analyses and validation required by DoD and Army guidance to determine the training, test, and float procurement quantities they submitted for approval in the June 2017 AAO. We will provide a copy of the report to the senior Army officials responsible for internal controls.

⁷ DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013.

Finding

The Army Did Not Justify All AH-64E Procurement Quantities

G-8 and G-3/5/7 officials justified planned procurement quantities of AH-64Es designated for regular Army and ARNG operational fleets. However, G-8, G-3/5/7, and G-4 officials could not justify the planned procurement quantities of 85 training, 67 float, and 15 test AH-64Es.

This occurred because G-8, G-3/5/7, and G-4 officials did not conduct the analyses required by DoD and Army guidance to determine the necessary training, float, and test quantities before the Deputy Chief of Staff of the Army, G-8, approved the AAO on June 15, 2017.

As a result, G-8 officials cannot ensure that 167 AH-64Es for training, float, and test, valued at \$3.5 billion, will meet the needs of the Army. Additionally, G-8 officials have no assurance that the AH-64E program is affordable. If too many AH-64Es are procured, the Army could be wasting DoD funds that could be put to better use. If too few AH-64Es are procured, the Army may not be able to train enough pilots to meet Army operational needs, provide replacements for AH-64Es that cannot be repaired in time to meet readiness objectives, or test and evaluate other weapon systems that are added to the AH-64E.

Army Officials Justified Quantities for Operational AH-64Es

G-8 and G-3/5/7 officials justified planned procurement quantities of the AH-64Es designated for regular Army and ARNG operational fleets. The Army increased the operational fleet from 528 to 600 AH-64Es, including 72 AH-64Es for the ARNG, based on the NCFR analysis and recommendations. The Army included the increased operational fleet in Army Structure Memorandum 20-24. Army Structure Memorandum 20-24 is the official force structure for FYs 2017 to 2024 and informs Army officials of annually approved force structure changes. The Secretary of the Army approved the force structure in November 2017.

Operational AH-64Es for the Regular Army

G-3/5/7 officials justified the need for 528 AH-64Es, valued at \$11.1 billion, for the regular Army's operational fleet. Army Structure Memorandum 20-24 outlined the official force structure for FYs 2017 to 2024 and identified 22 regular Army attack reconnaissance battalions. The Army Aviation Field Manual is the Army's doctrine for conducting aviation operations and dictates that each attack reconnaissance battalion be equipped with 24 AH-64Es.⁸ G-3/5/7 officials determined the quantity necessary for the regular Army's operational fleet by multiplying 22 attack reconnaissance battalions by 24 AH-64Es authorized for each battalion.

Operational AH-64Es for the ARNG

G-3/5/7 officials justified the need for 72 AH-64Es, valued at \$1.5 billion, for the ARNG. Based on the NCFAs analysis and recommendations, the Secretary of the Army approved equipping four ARNG attack reconnaissance battalions with 18 AH-64Es in Army Structure Memorandum 20-24. In the memorandum, copied to the Secretary of Defense and Members of Congress, the Chief of Staff of the Army stated, "The recommendations of the NCFAs provide an opportunity to strengthen and unify the components of the Army. We have seized that opportunity." Congress subsequently supported the increase and appropriated funding in the FY 2018 Consolidated Appropriations Act to procure the 767 AH-64Es, including the 72 AH-64Es for the ARNG.⁹

Army Officials Did Not Justify Other AH-64E Procurement Quantities

G-3/5/7 officials were unable to provide analysis to support that 167 AH-64Es, valued at \$3.5 billion, aligned with mission needs for the training, float, and test fleets.

G-8, G-3/5/7, and G-4 officials could not justify the planned procurement quantity of AH-64Es designated for training, float, and test. Specifically, G-3/5/7 officials were unable to provide analysis to support that 167 AH-64Es, valued at \$3.5 billion, aligned with mission needs for the training, float, and test fleets. We consider the quantity justified when the analysis and rationale for procurement decisions are documented and show that the quantity meets warfighter needs, and complies with Army guidance regarding procurement quantity. Table 3 shows the planned and unjustified AH-64E procurement quantities by sub-element.

⁸ Field Manual 3-04, "Army Aviation," July 2015.

⁹ Public Law 115-141, "Consolidated Appropriations Act, 2018," March 23, 2018.

Table 3. AH-64E Planned and Unjustified Procurement Quantities

AAO Sub-Element	Planned Quantity	Unjustified Quantity	Unjustified Cost (in billions)*
Operational - regular Army (22 Army Battalions x 24 AH-64Es Per Battalion)	528	0	\$0.0
Operational - ARNG (4 Battalions x 18 AH-64Es Per Battalion)	72	0	0.0
Training	85	85	1.8
Float (8 RCF + 59 ORF)	67	67	1.4
Test	15	15	0.3
Total AH-64Es in the June 15, 2017, AAO	767	167	\$3.5

* Based on a weighted average unit cost of \$21.0 million. See the Appendix for the calculation.

Source: The DoD OIG.

Army Officials Did Not Conduct Analyses to Determine Training, Float, and Test Quantities

G-8, G-3/5/7, and G-4 officials did not conduct the analyses required by DoD and Army guidance to determine the necessary training, float, and test quantities before the Deputy Chief of Staff of the Army, G-8, approved the AAO on June 15, 2017. Army Regulation 70-1 requires the G-3/5/7 to conduct force integration analyses to assess supportability and affordability for equipment, funding, and training.¹⁰ Army Regulation 71-32 requires the G-3/5/7 to coordinate with other Army staff with responsibilities for equipping, training, and funding of an organizational structure to evaluate affordability, supportability, and feasibility.¹¹ In addition, prior to the approval of the June 2017 AAO, the Army issued Execute Order 165-17, which establishes procedures for preparing and maintaining AAOs.¹²

Execute Order 165-17 requires the Army to revalidate an equipment quantity if the quantity stated in an AAO changes. The order requires G-8 to prepare an adjustment request packet when any increases in an AAO are recommended by G-3/5/7 and G-4. Since the AH-64E quantity changed from 690 to 767, the total planned quantity of 767 must be revalidated, including the sub-elements for the training, float, and test fleets. The adjustment request packet includes a memorandum of quantity justification and documents supporting the quantity

¹⁰ Army Regulation 70-1, "Army Acquisition Policy," July 22, 2011, (updated June 16, 2017).

¹¹ Army Regulation 71-32, "Force Development and Documentation," July 1, 2013.

¹² Execute Order 165-17, "Procedures for Maintaining the Army Acquisition Objective, Army Procurement Objective, and Retention Objective," May 12, 2017.

change. In addition, Execute Order 165-17 states that, while the G-8 approves the AAO and its quantities, the G-3/5/7 is responsible for prioritizing requirements, authorizing AAO sub-element quantities, assessing affordability, and implementing AAO approval procedures. G-3/5/7 and G-4 officials could not provide evidence to support that the training, float, and test quantities were analyzed. Without analyzing quantity, G-3/5/7 and G-8 officials cannot effectively assess whether the change in quantity is affordable.

Further, DoD Instruction 7041.03 requires a cost-effective economic analysis of any Government decisions to initiate, renew, or expand a program.¹³ An economic analysis must include assumptions, alternatives, costs and benefits, comparison of alternatives, and results of analysis and recommendations and must be retained. DoD Instruction 5015.2 requires Army officials to retain documents that support business decisions.¹⁴

Training

G-3/5/7 officials could not justify the planned procurement quantity of 85 AH-64Es for training, valued at \$1.8 billion. G-8 and G-3/5/7 officials were unable to support how the quantity was developed for the AAO. In June 2017, G-8 officials increased the quantity of AH-64Es from 80 to 85. G-3/5/7 officials did not conduct the analyses and reviews required by Army regulations to determine whether the planned procurement quantity supported future Army needs. G-8 and G-3/5/7

G-3/5/7 should have revalidated all 85 AH-64Es planned for training in accordance with Execute Order 165-17.

officials explained that they used the quantity of 80 AH-64Es from the FY 2013 approved acquisition program baselines and included 5 additional AH-64Es because of the increase to the ARNG. Execute Order 165-17 requires the Army to revalidate the quantity of equipment if the quantity stated in the AAO changes. Since the Army increased the AH-64E quantity from 690 to 767, the G-3/5/7 should have revalidated all 85 AH-64Es planned for training in accordance with Execute Order 165-17. G-8 and G-3/5/7

officials could not provide the basis for 80 AH-64Es. G-3/5/7 officials stated that a thorough analysis was performed; however, the G-3/5/7 was unable to provide that analysis.

¹³ DoD Instruction 7041.03, "Economic Analysis for Decision Making," September 9, 2015, (Incorporating Change 1, October 2, 2017).

¹⁴ DoD Instruction 5015.2, "DoD Records Management Program," February 24, 2015, (Incorporating Change 1, August 17, 2017).

The quantity of 85 AH-64Es designated for training in the AAO was not developed using the required analyses and reviews. G-8 and G-3/5/7 officials added five AH-64Es to the previously approved procurement quantity without analyzing whether the quantity will meet user needs. Therefore, the Army has no assurance that this quantity reflects the Army's actual training needs. Designating more AH-64Es for training than necessary reduces resources and funds available for other AH-64E sub-elements in the AAO. However, designating too few AH-64Es for training could lead to training delays, resulting in fewer pilots available to meet the Army's operational aviation needs. Therefore, G-3/5/7 officials should coordinate with U.S. Army Aviation Center of Excellence to determine the necessary quantity of AH-64Es for training. G-3/5/7 officials should also analyze the supportability, affordability, and feasibility of AH-64Es to determine the quantity necessary for training and submit changes to the AAO to the G-8 in accordance with Execute Order 165-17. Further, G-3/5/7 officials should prepare and retain supporting documentation for decisions justifying the necessary quantities of AH-64Es in accordance with DoD Instruction 5015.2. G-8 officials should review and validate that G-3/5/7 officials can justify the determined quantities of AH-64Es and that proper reviews and analyses are conducted before approving training quantities. G-8 should also prepare and retain supporting documentation for decisions to approve the AAO in accordance with DoD Instruction 5015.2.

Float

G-4 officials could not justify the planned procurement quantity of 67 AH-64Es for float, valued at \$1.4 billion. According to Execute Order 165-17, the G-4 serves as the lead for the calculation of the ORF and RCF. The G-8 then approves the ORF and RCF quantities before forwarding them to the G-3/5/7 for inclusion in the AAO. However, G-8, G-3/5/7, and G-4 officials were unable to support how the quantity was developed for the AAO. The 67 AH-64Es in the float sub-element included 59 ORF and 8 RCF. Army Regulation 750-1 contains formulas that are required to be used to calculate procurement quantities for both the ORF and the RCF.¹⁵ However, rather than use these formulas, G-8 and G-3/5/7 officials relied on the quantity from the FY 2013 approved acquisition program baselines to determine the quantity for float.

G-8 officials stated that the quantity of 67 AH-64Es for the float sub-element was discussed in a Research and Development Corporation report.¹⁶ The Research and Development Corporation, the Army's federally funded research center for studies and analysis, reported on the history of the Aviation Restructure Initiative in

¹⁵ Army Regulation 750-1, "Army Material Maintenance Policy," September 12, 2013, (updated August 3, 2017).

¹⁶ Research and Development Corporation Report, "The Army's 2013 Aviation Restructure Initiative: A History and Assessment," February 2016.

this report. While this report discussed the 67 AH-64Es for float, it did not show that the quantity was based on formulas or provide analysis that supported how the quantity was determined. G-8, G-3/5/7, and G-4 officials could not provide any documents or analysis to support how the quantity of 67 AH-64Es for the float was developed.

Operational Readiness Float

G-4 officials stated that they relied on officials from the Apache Program Office to determine the quantity of AH-64Es necessary for the ORF using the formula in Army Regulation 750-1. The formula in Army Regulation 750-1 uses the number of days AH-64Es cannot perform combat missions because of maintenance work to calculate the required quantity. While officials from the Apache Program Office provided a calculated quantity for AH-64Es for ORF using the formula in Army Regulation 750-1, the formula resulted in an ORF quantity of 79—20 more AH-64Es than the planned quantity identified in the AAO. G-4 and G-8 officials incorrectly stated that the lower quantity of 59 ORF AH-64Es in the AAO was justified because the formula produced the higher ORF quantity of 79. In addition, officials from the Apache Program Office calculated the need for 79 ORF AH-64Es in July 2017, after the AAO was approved. Therefore, we have no assurance that the ORF quantity of 59 in the AAO reflects a quantity that was calculated using the formula in Army Regulation 750-1. Further, G-8, G-3/5/7, and G-4 officials could not provide any documents or analysis to support whether the quantity of 59 AH-64Es is necessary for ORF.

Additionally, while it is possible to calculate ORF quantities using the formula in Army Regulation 750-1, it may not result in a quantity that reflects the quantity of AH-64Es actually needed to maintain readiness. In 2016, the Army Audit Agency reported that the formula in Army Regulation 750-1 does not accurately reflect ORF need because it does not consider warfighter demand.¹⁷

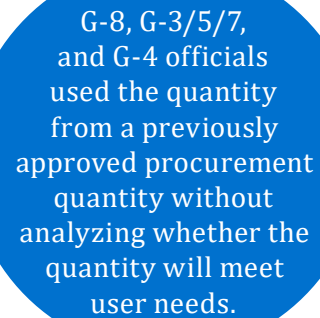
Repair Cycle Float

G-4 officials explained that Army Regulation 750-1 contains a formula that calculates the authorized quantity for the RCF; however, G-4 officials stated that they did not use the prescribed formula because it was not clearly written. G-4 officials stated that they were aware of how the formula for RCF should have been written, but chose not to apply it when determining the quantity of AH-64Es necessary for the RCF and instead used the quantity determined to meet core requirements. G-4 officials explained that core requirements identify the amount of direct labor hours and minimum skill levels required to repair equipment and

¹⁷ A-2017-0011-ALM, "Operational Readiness Float Requirements (CONUS)," December 5, 2016.

meet increased requirements due to war and other national emergencies. The direct labor hours are then converted to an equipment quantity. G-4 officials' use of core requirements to develop the RCF quantity was incorrect because the RCF and the core calculation are used for different purposes. RCF resources are used when a helicopter needs to be temporarily replaced because it has been turned into the depot for routine maintenance whereas the core requirements are the maintenance workload, skills, and facilities that are needed at the depot when preparing for war and other national emergencies. G-4 officials could not explain how the core calculation could accurately identify the quantity necessary for the RCF. In addition, the quantity of AH-64Es calculated to meet core requirements did not match the planned quantity identified in the AAO. Therefore, we have no assurance that G-4 officials used the quantity determined to meet core requirements to determine eight RCF AH-64Es were necessary.

The quantity of 67 AH-64Es designated for float in the AAO was not developed using the required formulas. G-8, G-3/5/7, and G-4 officials used the quantity from a previously approved procurement quantity without analyzing whether the quantity will meet user needs. Therefore, the Army has no assurance that this quantity reflects the Army's actual float needs. If the Army procures too many AH-64Es for float, the Army could be wasting DoD funds that could be put to better use. If the Army procures too few AH-64Es for float, the Army may not have enough AH-64Es necessary to temporarily replace those AH-64Es that cannot be repaired in time to meet readiness objectives.



G-8, G-3/5/7, and G-4 officials used the quantity from a previously approved procurement quantity without analyzing whether the quantity will meet user needs.

Therefore, G-4 officials should analyze and determine the AH-64E quantity necessary for float and submit AAO recommendations to the G-3/5/7 and G-8 in accordance with Execute Order 165-17. G-4 officials should prepare and retain supporting documentation for decisions justifying the necessary quantities of AH-64Es in accordance with DoD Instruction 5015.2. In addition, G-4 officials should review and determine whether the ORF and RCF calculations in Army Regulation 750-1 should be updated. G-3/5/7 officials should review and approve the float quantities submitted and determined by the G-4 and ensure that determined quantities of AH-64Es are based on mission needs for float. G-8 officials should review and validate that the G-4 can justify the determined quantities of AH-64Es based on mission needs for float before approving ORF and RCF quantities. G-8 officials should also prepare and retain supporting documentation for decisions to approve the AAO in accordance with DoD Instruction 5015.2.

Test

G-3/5/7 officials could not justify the planned procurement quantity of 15 AH-64Es for test, valued at \$315 million. G-8 and G-3/5/7 officials were unable to support how the quantity was developed for the AAO. Rather than conducting an analysis, G-8 and G-3/5/7 officials explained that they used the quantity of 15 test AH-64Es from the FY 2013 approved acquisition program baselines.

Apache Program Office officials and G-3/5/7 officials could not explain the basis for the 15 test aircraft or how the quantity was developed for the AAO.

Army Regulation 70-1 states that the program manager plans all developmental and operational testing and other resources used for testing. However, Apache Program Office officials and G-3/5/7 officials could not explain the basis for the 15 test aircraft or how the quantity was developed for the AAO. Further, Apache Program Office officials stated that they did not provide any input and were not aware that G-3/5/7 officials planned a quantity of 15 AH-64Es for test.

Apache Program Office officials explained that the 15 AH-64Es identified in the AAO for test would be used to conduct developmental and operational testing on weapon systems that will be added to the Apache. For example, Hellfire and Joint Air to Ground Missile weapons will be tested on these 15 Apaches. Apache Program Office officials stated that 15 test aircraft would not be necessary for the entire AH-64E life cycle and projected that the test fleet will decline to 11 Apaches by FY 2021. In addition, the quantity of 15 AH-64Es identified for test in the AAO conflicts with other Apache program documents. For example, the acquisition strategy (the plan for executing the AH-64E program during its life cycle) states that AH-64E developmental testing will not occur after FY 2017. In addition, the capability production document, which contains information related to production, states that four AH-64Es are necessary for a future operational test.

The quantity of 15 AH-64Es designated for test in the AAO was not developed using the required analysis and review. G-8 and G-3/5/7 officials used the quantity from a previously approved procurement quantity without analyzing whether the quantity will meet user needs. Therefore, the Army has no assurance that this quantity reflects the Army's actual testing needs. Designating more AH-64Es for test than necessary reduces resources and funds available for use in other sub-elements of the AAO. We found no justification for the 15 AH-64Es contained in the AAO, and the quantity conflicts with other AH-64E documents. Therefore, G-3/5/7 officials should coordinate with the Apache Program Office to determine the necessary quantity of AH-64Es for test. G-3/5/7 officials should also analyze the supportability, affordability, and feasibility of AH-64Es to determine the

quantity necessary for testing and submit changes to the AAO in accordance with Execute Order 165-17. Further, G-3/5/7 officials should prepare and retain supporting documentation for decisions justifying the necessary quantities of AH-64Es in accordance with DoD Instruction 5015.2. G-8 officials should review and validate that G-3/5/7 officials can justify the determined quantities of AH-64Es and that proper reviews and analyses are conducted before approving test quantities. G-8 should also prepare and retain supporting documentation for decisions to approve the AAO in accordance with DoD Instruction 5015.2.

AH-64E Procurement Quantities May Not Meet Army Needs

G-8 officials cannot ensure that 167 AH-64Es for training, float, and test, valued at \$3.5 billion, will meet the needs of the Army or that the AH-64E program is affordable. In an attempt to justify the quantities after the AAO was approved, G-8 and G-3/5/7 officials stated that they used a previously approved quantity of 80 AH-64Es for training and added 5 AH-64Es based on the increase to the operational fleet quantity—without doing any analysis to support the training quantity. G-4 officials used a previously approved procurement quantity of 67 AH-64Es for float rather than using required formulas to calculate procurement quantities. Apache Program Office officials explained that the test fleet will decline to 11 Apaches by FY 2021 and 15 test Apaches are not necessary for the entire AH-64E life cycle. In addition, G-8, G-3/5/7, and G-4 officials did not provide any analyses to support the planned quantity for training, float, and test fleets or the quantity necessary to effectively meet mission needs.

The planned procurement quantity must meet user needs, based on required analyses, and the Army must document the rationale for informed decision-making. If too many AH-64Es are procured, the Army could be wasting DoD funds that could be put to better use. If too few AH-64Es are procured, the Army may not be able to train enough pilots to meet Army operational needs, provide replacements for AH-64Es that cannot be repaired in time to meet readiness objectives, or test and evaluate other weapon systems that are added to the AH-64E. In addition, any increase in quantity will increase the program's total life cycle cost and any decrease to quantity will likely result in an increased program acquisition unit cost.¹⁸ Therefore, any quantity increase or decrease will impact program cost, which could make the program unaffordable over its life cycle. Execute Order 165-17 requires the G-8 to assess affordability. G-8 officials

¹⁸ Program acquisition unit cost includes costs for research, development, testing and evaluation, procurement, and military construction and excludes costs for operations and sustainment.

should coordinate with G-3/5/7 officials to assess affordability after the G-3/5/7 and G-4 have determined that quantities of AH-64Es are based on mission need and to ensure that the planned procurement quantity is a sustainable investment decision that can be supported based on future budget expectations.

Recommendations, Management Comments, and Our Response

Recommendation 1

We recommend that the Deputy Chief of Staff of the Army, G-8:

- a. Review and validate that the Deputy Chief of Staff of the Army, G-3/5/7, can justify the determined quantities of the AH-64E and that proper reviews and analyses are conducted before approving training and test quantities.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-8, agreed, stating that the Army has conducted a review of Army Acquisition Objective regulations and policies and has updated the methodology used to determine the Army Acquisition Objective. Further, G-3/5/7 officials will publish a policy letter requiring annual revalidation of Army Acquisition Objective documents and will capture revalidation results in a written execution order that documents the G-3/5/7 and G-8 analyses. In addition, the Army has developed a simplified demand-based formula to determine the number AH-64Es necessary for training. The Army has also determined a baseline quantity of AH-64Es required to support the test fleet and will adjust the quantity annually during the revalidation of the Army Acquisition Objective. On May 14, 2018, the Deputy Chief of Staff of the Army, G-8, approved an increase to the AH-64Es for training from 85 to 100, and a decrease to the AH-64Es for test from 15 to 7.

Our Response

Comments from the Vice Chief of Staff of the Army did not address the specifics of the recommendation; therefore, the recommendation is unresolved. The Vice Chief of Staff of the Army did not specify the actions the G-8 will take during the annual revalidation of the Army Acquisition Objective to verify that the G-3/5/7 conducted the reviews and analysis required before approving training and test quantities. Army Regulation 70-1 requires G-3/5/7 to assess the supportability and affordability of equipment and training. DoD Instruction 7041.03 requires analysis of cost and benefits, assumptions, alternatives, and comparison of alternatives. Execute Order 165-17 requires the G-3/5/7 to prioritize requirements, authorize

quantities, and assess affordability. To resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-8, provide the policy letter requiring annual revalidation of the Army Acquisition Objective documents. We also request that the Deputy Chief of Staff of the Army, G-8, provide the analysis to support that 100 AH-64Es for training and 7 AH-64Es for test identified in the Army Acquisition Objective, approved May 14, 2018, reflects the Army's actual needs across the program's life cycle. We will close this recommendation when we verify the analysis justifies the quantities for training and test.

- b. Review and validate that the Deputy Chiefs of Staff of the Army, G-3/5/7 and G-4, can justify the determined quantities of AH-64Es based on mission needs for float before approving Operational Readiness Float and Repair Cycle Float quantity.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-8, agreed, stating that the Army has conducted a review of Army Acquisition Objective regulations and policies and has updated the methodology used to determine the Army Acquisition Objective. Further, G-3/5/7 officials will publish a policy letter requiring annual revalidation of the Army Acquisition Objective documents and will capture revalidation results in a written execution order that documents the G-3/5/7, G-4, and G-8 analyses. In addition, the Army has developed a simplified demand-based formula to determine the number AH-64Es necessary for the Operational Readiness Float and Repair Cycle Float. On May 14, 2018, the Deputy Chief of Staff of the Army, G-8, approved a decrease to the AH-64Es for Operational Readiness Float from 59 to 25, and an increase to the AH-64Es for Repair Cycle Float from 8 to 56.

Our Response

Comments from the Vice Chief of Staff of the Army did not address the specifics of the recommendation; therefore, the recommendation is unresolved. The Vice Chief of Staff of the Army did not specify the actions G-8 will take during the annual revalidation of the Army Acquisition Objective to verify that the G-3/5/7 and G-4 conducted the reviews and analysis required before approving Operational Readiness Float and Repair Cycle Float quantities. Army Regulation 70-1 requires G-3/5/7 to assess the supportability and affordability of equipment and training. DoD Instruction 7041.03 requires that analysis include cost and benefits, assumptions, alternatives, and comparison of alternatives. Execute Order 165-17 states that the G-4 is the lead for calculating float quantities. To resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-8, provide the analysis to support that the 25 AH-64Es for the Operational Readiness

Float and 56 AH-64Es for the Repair Cycle Float identified in the Army Acquisition Objective, approved May 14, 2018, reflects the Army's actual needs across the program's life cycle. We will close this recommendation when we verify the analysis justifies the quantities for float.

- c. Prepare and retain supporting documentation for decisions to approve the Army Acquisition Objective in accordance with DoD Instruction 5015.2.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-8, agreed, stating that G-3/5/7 officials will publish a policy letter requiring annual revalidation of the Army Acquisition Objective documents and will capture revalidation results in a written execution order that documents G-8 analysis.

Our Response

Comments from the Vice Chief of Staff of the Army partially addressed the recommendation; therefore, the recommendation is unresolved. The Vice Chief of Staff of the Army did not address whether G-8 analysis will be retained. Therefore, to resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-8, specify how G-8 officials will comply with the DoD Instruction 5015.2 requirement to retain the analysis and results used to inform the decision to approve the Army Acquisition Objective. We will close this recommendation when we verify the Army has a policy to retain analysis used to determine the Army Acquisition Objective.

- d. Coordinate with Deputy Chief of Staff of the Army, G-3/5/7, officials to assess affordability after Deputy Chiefs of Staff of the Army, G-3/5/7 and G-4, have determined that quantities of AH-64Es are based on mission need and to ensure that the planned procurement quantity is a sustainable investment decision that can be supported based on future budget expectations.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-8, agreed, stating that, through the annual programming processes, the Army will continuously conduct affordability assessments to ensure that planned procurement quantities are sustainable based on future budget expectations.

Our Response

Comments from the Vice Chief of Staff of the Army addressed the specifics of the recommendation; therefore, the recommendation is resolved. We will close this recommendation when the Army defines how and when affordability assessments will be conducted.

Recommendation 2

We recommend that the Deputy Chief of Staff of the Army, G-3/5/7:

- a. Coordinate with U.S. Army Aviation Center of Excellence and the Apache Program Office to determine the necessary quantity of AH-64Es for training and test.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-3/5/7, agreed, stating that the G-8 validated and signed a new Army Acquisition Objective. On May 14, 2018, the Deputy Chief of Staff of the Army, G-8, approved an increase to the AH-64Es for training from 85 to 100 and a decrease to the AH-64Es for test from 15 to 7.

Our Response

Comments from the Vice Chief of Staff of the Army did not address the specifics of the recommendation; therefore, the recommendation is unresolved. While the Deputy Chief of Staff of the Army, G-8, signed a new Army Acquisition Objective that approved 100 AH-64Es for training and 7 AH-64Es for test, the Deputy Chief of Staff of the Army, G-8, did not justify why 100 AH-64Es were necessary for training or 7 AH-64Es were necessary for test. To resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-3/5/7, provide analysis, in accordance with Army Regulations 70-1 and 71-32 and DoD Instruction 7041.03, to support that the training and test quantities identified in the Army Acquisition Objective, approved May 14, 2018, reflect the Army's actual needs across the program's life cycle. We will close this recommendation when we verify the analysis justifies the quantities for training.

- b. Analyze the supportability, affordability, and feasibility of AH-64Es to determine the quantity necessary for training and test and submit changes to the Army Acquisition Objective to the G-8 in accordance with Execute Order 165-17.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-3/5/7, agreed, stating that, through annual programming processes, the Army will continuously conduct affordability assessments to ensure planned procurement quantities are sustainable based on future budget expectations.

Our Response

Comments from the Vice Chief of Staff of the Army did not address the specifics of the recommendation; therefore, the recommendation is unresolved. The Vice Chief of Staff of the Army did not specify how affordability assessments would be used in determining the quantity necessary for training and test. To resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-3/5/7, specify when in the annual programming process G-3/5/7 officials will analyze the supportability, affordability, and feasibility of AH-64Es to determine the quantity necessary for training and test. We will close this recommendation when the Deputy Chief of Staff of the Army, G-3/5/7, provides the analysis.

- c. Review and approve the float quantities submitted and determined by Deputy Chief of Staff of the Army, G-4, and ensure that determined quantities of AH-64Es were based on mission needs for float.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-3/5/7, agreed, stating that the G-8 validated and signed a new Army Acquisition Objective. On May 14, 2018, the Deputy Chief of Staff of the Army, G-8, approved a decrease to the AH-64Es for Operational Readiness Float from 59 to 25 and an increase to the AH-64Es for Repair Cycle Float from 8 to 56.

Our Response

Comments from the Vice Chief of Staff of the Army did not address the specifics of the recommendation; therefore, the recommendation is unresolved. While the Deputy Chief of Staff of the Army, G-8, signed a new Army Acquisition Objective, the Deputy Chief of Staff of the Army did not specify how the G-3/5/7 justified the 25 AH-64Es needed for Operational Readiness Float and 56 AH-64Es needed for Repair Cycle Float. To resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-3/5/7, specify how the G-3/5/7 verified that the

G-4 conducted reviews and analysis to justify that 25 AH-64Es are needed for Operational Readiness Float and 56 AH-64Es are needed for Repair Cycle Float. We will close this recommendation when we verify the analysis justifies the quantities for float.

- d. Prepare and retain supporting documentation for decisions justifying the necessary quantities of AH-64Es in accordance with DoD Instruction 5015.2.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-3/5/7, agreed, stating that G-3/5/7 officials will publish a policy letter requiring annual revalidation of the Army Acquisition Objective documents and will capture revalidation results in a written execution order that documents the analysis of G-3/5/7 officials.

Our Response

Comments from the Vice Chief of Staff of the Army partially addressed the recommendation; therefore, the recommendation is unresolved. The Vice Chief of Staff of the Army did not address whether G-3/5/7 analysis will be retained. Therefore, to resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-3/5/7, specify how G-3/5/7 officials will comply with the DoD Instruction 5015.2 requirement to retain the analysis and results used to inform the decision to approve the Army Acquisition Objective. We will close this recommendation when we verify the Army has a policy to retain analysis used to determine the Army Acquisition Objective.

Recommendation 3

We recommend that the Deputy Chief of Staff of the Army, G-4:

- a. Analyze and determine the AH-64E quantity necessary for float and submit Army Acquisition Objective recommendations to the Deputy Chiefs of Staff of the Army, G-3/5/7 and G-8, in accordance with Execute Order 165-17.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-4, agreed, stating that the G-8 validated and signed a new Army Acquisition Objective. On May 14, 2018, the Deputy Chief of Staff of the Army, G-8, approved a decrease to the AH-64Es for Operational Readiness Float from 59 to 25, and an increase to the AH-64Es for Repair Cycle Float from 8 to 56.

Our Response

Comments from the Vice Chief of Staff of the Army did not address the specifics of the recommendation; therefore, the recommendation is unresolved. While the Deputy Chief of Staff of the Army, G-8, signed a new Army Acquisition Objective, the Vice Chief of Staff of the Army did not specify how the G-4 determined the quantities of 25 AH-64Es for the Operational Readiness Float and 56 AH-64Es for the Repair Cycle Float. To resolve and close this recommendation, we request that the Deputy Chief of Staff of the Army, G-4, specify how the G-4 determined the quantities of 25 AH-64Es for the Operational Readiness Float and 56 AH-64Es for the Repair Cycle Float. We also request that the Deputy Chief of Staff of the Army, G-4, provide the analysis, conducted in accordance with DoD Instruction 7041.3, to support that the Operational Readiness Float and Repair Cycle Float quantities identified in the Army Acquisition Objective, approved May 14, 2018, reflect the Army's needs across the program's life cycle. We will close this recommendation when we verify the analysis justifies the quantities for float.

- b. Prepare and retain supporting documentation for decisions justifying the necessary quantities of AH-64Es in accordance with DoD Instruction 5015.2.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army G-4, agreed, stating that G-3/5/7 officials will publish a policy letter requiring annual revalidation of the Army Acquisition Objective documents and will capture revalidation results in a written execution order that documents the analysis by G-4 officials.

Our Response

Comments from the Vice Chief of Staff of the Army partially addressed the recommendation; therefore, the recommendation is unresolved. The Vice Chief of Staff of the Army did not address whether G-4 analysis will be retained. Therefore, to resolve this recommendation, we request that the Deputy Chief of Staff of the Army, G-4, specify how G-4 officials will comply with the DoD Instruction 5015.2 requirement to retain analysis and results used to inform the decision to approve the Army Acquisition Objective. We will close this recommendation when we verify the Army has a policy to retain analysis used to determine the Army Acquisition Objective.

- c. Review and determine whether the Operational Readiness Float and Repair Cycle Float calculation in Army Regulation 750-1 should be updated.**

Office of the Vice Chief of Staff of the Army

The Vice Chief of Staff of the Army, responding for the Deputy Chief of Staff of the Army, G-4, agreed, stating that the Army has developed a simplified demand-based formula to determine the number of AH-64Es necessary for the Operational Readiness Float and Repair Cycle Float. The Vice Chief of Staff stated the Operation Readiness Float formula will use required flight hours and maintenance intervals and the Repair Cycle Float formula will use procurement quantities compared with historical depot repair requirements.

Our Response

Comments from the Vice Chief of Staff of the Army addressed all specifics of the recommendation, and no further comments are required. Therefore, the recommendation is resolved but will remain open. We will close the recommendation once we verify that Army Regulation 750-1 has been updated with the new formulas.

Appendix

Scope and Methodology

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

We conducted site visits at the Pentagon, Washington D.C.; Fort Rucker, Alabama; and Redstone Arsenal, Alabama. We conducted interviews with personnel from:

- Deputy Chief of Staff of the Army, G-8 (Resource Management);
- Deputy Chief of Staff of the Army, G-3/5/7 (Operations, Plans, and Training);
- Deputy Chief of Staff of the Army, G-4 (Logistics);
- Apache Program Office;
- U.S. Army Training and Doctrine Command;
- U.S. Army Aviation Center of Excellence; and
- Army National Guard.

We reviewed available documentation that G-8, G-3/5/7, and G-4 officials used to determine and justify planned procurement quantities of AH-64E aircraft. We collected and analyzed documents dated November 2003 through September 2017. Examples of documents we reviewed and analyzed were:

- Aviation Studies, dated November 1, 2003, and February 22, 2010;
- Capability Production Documents, dated April 19, 2010; April 2, 2013; and June 14, 2017;
- Acquisition Strategy for Apache, dated April 18, 2012;
- NCFA Report, dated January 28, 2016;
- Research and Development Corporation report, dated February 2016;
- Testing Evaluation Master Plans, dated June 27, 2006; May 7, 2010; July 10, 2012; and October 19, 2016;
- Remanufactured AH-64E Acquisition Program Baseline, dated November 2012;
- New Build AH-64E Acquisition Program Baseline, dated July 2013;
- AH-64E AAO, dated June 15, 2017;

- ORF Calculation, dated July 2017;
- Monthly Aircraft Status Reports, dated October 15, 2016 through September 15, 2017; and
- Army Structure Memorandum 20-24, "Total Army Analysis 2020-2024," December 8, 2017.

The Army does not distinguish between the remanufactured and new build AH-64Es before fielding because all deliverable AH-64Es are the same. However, there is a difference in total life-cycle costs for the two programs. Therefore, there is a difference in average procurement unit costs for remanufactured and new build AH-64Es. The Army was not able to identify whether the planned quantities for training, test, and float were remanufactured or new build AH-64Es. We calculated the weighted average unit cost of the AH-64E to be \$21.0 million for training, float, and test quantities that were not justified. We used the planned quantity of AH-64Es new build and remanufactured, multiplied by the average procurement unit cost contained in Acquisition Program Baselines $([46 \text{ new builds} \times \$33.6 \text{ million}] + [721 \text{ remanufactured} \times \$20.2 \text{ million}]) / 767 \text{ AH-64Es} = \21.0 million).

In addition, we reviewed FY 2018 equipment authorizations on the Army Force Management website to identify the number of operational AH-64Ds and AH-64Es in the Apache fleet as of March 2018. We identified policies, procedures, and practices used by the Army to determine procurement quantities, and applied professional judgement when gathering corroborating evidence to ensure a reasonable basis for the findings and conclusions within the context of audit objectives. For example, the Army determines the proper mix of units for the Army during an extensive force development process that results in an Army Structure Memorandum. The Army Structure Memorandum directs the organizational authorizations within the Army. We considered the Army Structure Memorandum as sufficient support for the force structure. We reviewed applicable guidance to determine whether the Army justified the procurement quantities for the AH-64E remanufacture and new build helicopter programs. We reviewed guidance contained in:

- DoD Instruction 5000.02, "Operation of the Defense Acquisition System," Change 3, August 10, 2017;
- Execute Order 165-17, "Procedures for Maintaining the Army Acquisition Objective, Army Procurement Objective, and Retention Objective," May 12, 2017;
- Army Regulation 710-1, "Centralized Inventory Management of the Army Supply System," November 28, 2016;

- Army Regulation 750-1, “Army Materiel Maintenance Policy,” September 12, 2013, (updated August 3, 2017);
- Army Regulation 71-32, “Force Development and Documentation,” July 1, 2013;
- Field Manual 3-04, “Army Aviation,” July 2015;
- U.S. Army Training and Doctrine Command Regulation 71-20, “Concept Development, Capabilities Determination, and Capabilities Integration,” June 28, 2013;
- U.S. Army Training and Doctrine Command Regulation 71-12, “U.S. Army Training and Doctrine Command Capability Management,” October 3, 2012;
- Army Regulation 70-1, “Army Acquisition Policy,” July 22, 2011, (updated June 16, 2017);
- Army Regulation 71-9, “Warfighting Capabilities Determination,” December 28, 2009;
- DoD Directive 5000.01, “The Defense Acquisition System,” November 20, 2007;
- Army Regulation 71-11, “Total Army Analysis,” December 29, 1995; and
- DoD Instruction 5015.2, “DoD Records Management Program,” February 24, 2015, (Incorporating Change 1, August 17, 2017).

Use of Computer-Processed Data

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

Prior Coverage

During the last 5 years, the Government Accountability Office (GAO) and the U.S. Army Audit Agency issued four reports discussing the Apache program. Unrestricted GAO reports can be accessed at <http://www.gao.gov>. Unrestricted Army Audit Agency reports can be accessed from .mil and gao.gov domains at <https://www.aaa.army.mil/>.

GAO

GAO Testimony before the National Commission on the Future of the Army: “Army Force Structure, Observations about Aviation Restructuring, and Other Relevant Force Structure Challenges,” May 20, 2015

GAO testified before the National Commission on the Future of the Army and discussed the results of GAO-15-430R, “Force Structure: Army’s Analyses of Aviation Alternatives,” April 27, 2015. GAO found that the Army’s approach to comparing proposals under a major combat operation scenario was suitable, but comparisons under modified scenarios would have provided better insight. In addition, GAO found that the Army’s cost analysis of both proposals provided limited value for projecting actuals costs and cost savings.

GAO-15-430R, “Force Structure: Army’s Analyses of Aviation Alternatives,” April 27, 2015

GAO evaluated the Army’s analysis of the regular Army and ARNG force structure proposals regarding transferring AH-64 Apache helicopters from the ARNG to the Army. GAO found that the Army’s approach to comparing proposals under a major combat operation scenario was suitable, but comparisons under modified scenarios would have provided better insight of the adaptability of both proposals. In addition, GAO found that the Army’s cost analysis of both proposals provided limited value for projecting actuals costs and cost savings.

GAO-13-294SP, “Defense Acquisitions—Assessments of Selected Weapon Programs,” March 2013

In its assessment of the DoD 2012 Major Defense Acquisition Programs, GAO reported on the cost, schedule, and performance of the AH-64E Remanufacture program.

U.S. Army Audit Agency

A-2017-0011-ALM, “Operational Readiness Float Requirements (CONUS),” December 5, 2016

The Army Audit Agency found that Army officials inconsistently reported authorized ORF AH-64Es. The Army Audit Agency found that Apache Program Office officials improperly calculated AH-64E ORF quantities, and that demands for ORF AH-64Es were minimal and didn’t support the need for the ORF program. Additionally, the Army Audit Agency found that the Army did not use the AH-64Es fielded for ORF.

Management Comments

Vice Chief of Staff of the Army



DEPARTMENT OF THE ARMY
OFFICE OF THE VICE CHIEF OF STAFF
201 ARMY PENTAGON
WASHINGTON, D.C. 20310-0201

MEMORANDUM FOR the Department of Defense, Office of the Inspector General,
4800 Mark Center Drive, Alexandria, VA 22350-3606

SUBJECT: Response to Department of Defense Office of the Inspector General Project No. D2017-D000AU-159.000, Recommendations 1.a through 3.c, dated 13 April 2018, Final Report "Procurement Quantities of the AH-64E Apache New Build and remanufacture Helicopter Programs".

1. The Office of the Vice Chief of Staff of the Army has reviewed the report and provides the following responses:

- a. The Army concurs with DoDIG recommendations 1.a through 3.c and has taken the following actions:
 - (1) The Army has conducted a holistic review of existing Army Acquisition Objective (AAO) regulations and policies. The G-3/5/7, G-4 and G-8 in coordination with the U.S. Army Aviation Center of Excellence (USAACE) and the Apache Program Office have updated methodology to determine the AAO. The G-8 has validated and signed the new AAO. Through annual programming processes, the Army will continuously ensure that affordability assessments of planned procurement quantities are sustainable based on future budget expectations.
 - (2) The G-3/5/7 will publish a policy letter directing an annual revalidation of all Aviation AAO documents prior to the Strategic Portfolio Analysis Review.
 - (3) The Army developed a simplified demand based formula for Operational Readiness Float (ORF) and Repair Cycle Float (RCF) aircraft using required flight hours and maintenance intervals for ORF and procurement quantities compared with historical depot repair requirements for RCF. These formulas will be documented in the applicable Army Regulations.
 - (4) There is no formula to determine test aircraft requirements; however the Army has determined a baseline quantity of aircraft required to support the AH-64 testing fleet. Baseline and surge test aircraft requirements will be adjusted annually during the AAO revalidation process.
 - (5) The Army developed a simplified demand based formula for training aircraft using the Army's projected Apache training requirements to maintain a steady state of readiness and student-to-aircraft ratio.

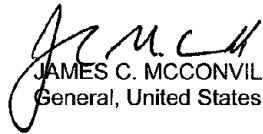
Vice Chief of Staff of the Army (cont'd)

SUBJECT: Response to Department of Defense Office of the Inspector General Project No. D2017-D000AU-159.000, Recommendations 1.a. through 3.c., dated 13 April 2018, Final Report "Procurement Quantities of the AH-64E Apache New Build and remanufacture Helicopter Programs".

(6) The G-3/5/7, DAMO-AV will capture the annual AAO revalidation results in a written Execution Order, documenting the analysis of G-3/5/7, G-4, G-8, USAACE, and the Apache Program Office.

2. The point of contact for this action is [REDACTED]

1 Encl
1. Revised AH-64 Apache AAO


JAMES C. MCCONVILLE
General, United States Army

Vice Chief of Staff of the Army (cont'd)



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-8
700 ARMY PENTAGON
WASHINGTON, DC 20310-0700

14 MAY 2018

DAPR-ZA

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Adjustment of the Army Procurement Objective and Army Acquisition Objective for the AH-64E Apache Helicopter (H05006)

1. References:

- a. Headquarters, Department of the Army Execution Order 109-14, Aviation Restructure Initiative (ARI), dated 12 October, 2016.
- b. AH-64E Helicopter, Increment 1, Version 6 Capability Production Document
- c. Headquarters, Department of the Army Execution Order 165-17, Procedures for Maintaining the Army Acquisition Objective, Army Procurement Objective, and Retention Objective, dated 12 May, 2017.
- d. Army Regulation 750-1, Army Material Maintenance Policy, dated 3 August 2017.
- e. Army Regulation 71-32, Force Development and Documentation, dated 1 July 2013.

1. The Chief of Staff, Army, has decided to resource all Attack Reconnaissance Battalions with 24 of 24 AH-64 Apaches. This decision, coupled with the recommendations from DoD IG Draft Report D2017-D000AU-159.000, led the Army staff to update and validate a revised Apache Army Procurement Objective (APO) and Army Acquisition Objective (AAO) for the AH-64E.

2. This memorandum increases the Army Acquisition Objective (AAO) from 767 to 812. It also established an Army Procurement Objective (APO) of 791. Both of these actions are detailed in the enclosure.

3. The AH-64E AAO is the total Army requirement that represents the unconstrained acquisition quantity requirement for Apaches to meet the minimum essential wartime requirement needed to equip and sustain the Army's approved master force.

4. The AH-64E APO is the determined portion of the AAO that is affordable at an acceptable level of risk to Army missions and modernization objectives.

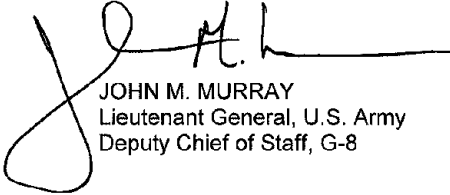
Vice Chief of Staff of the Army (cont'd)

DAPR-ZA

SUBJECT: Adjustment of the Army Procurement Objective and Army Acquisition Objective for the AH-64E Apache Helicopter (H05006)

5. The Headquarters, Department of the Army, Deputy Chief of Staff, G-8 point of contact for this action is [REDACTED]

Encl



JOHN M. MURRAY
Lieutenant General, U.S. Army
Deputy Chief of Staff, G-8

DISTRIBUTION:

Assistant Secretary of the Army for Acquisition, Logistics and Technology
Assistant Secretary of the Army for Financial Management, Comptroller
Deputy Chief of Staff, G-3/5/7
Deputy Chief of Staff, G-4
Commander, U.S. Forces Command
Commander, Army Materiel Command
Commander, Training and Doctrine Command
Commander, Communications-Electronics Command

Vice Chief of Staff of the Army (cont'd)

DAPR-ZA
 SUBJECT: Adjustment of the Army Acquisition Objective (AAO) for the AH-64E Apache Helicopter (H05006) Enclosure

a. Table

Element	AAO//APO//RO Current	AAO//APO//RO Proposed	AAO//APO//RO Delta	Comments
1. BOIP Impact: OTOE Quantity	600//600//600	624//624//624	24//24//24	
2. BOIP Impact: Training Base	85//85//85	100//100//100	15//15//15	Fort Rucker
3. BOIP Impact: Army Pre-Positioned Stock (Unit Sets)	0//0//0	0//0//0	0//0//0	
4. Sub-Total (1-3)	685//685//685	724//724//724	39//39//39	
5. APS Activity Sets	0//0//0	0//0//0	0//0//0	
6. Army War Reserve Sustainment Stocks	0//0//0	0//0//0	0//0//0	
7. War Reserve Stocks for Allies	0//0//0	0//0//0	0//0//0	
8. Operational Projects Stock	0//0//0	0//0//0	0//0//0	
9. Repair Cycle Float	8//8//8	56//38//38	48//30//30	
10. Operational Readiness Float	22//22//22	25//22//22	3//0//0	
11. Other TDA Requirements	15//15//15	7//7//7	-8//-8//-8	Test Assets
12. Other Requirements	37//37//37	0//0//0	-37//-37//-37	
13. Sub-Total (5 thru 12)	82//82//82	88//67//67	6//-15//-15	
TOTAL AAO/APO (4 and 13)**	767//767//767	812//791//791	45//24//24	

* CPD requires modification: No

Acronyms and Abbreviations

- AAO** Army Acquisition Objective
- ARNG** Army National Guard
- G-8** Deputy Chief of Staff of the Army, G-8
- G-3/5/7** Deputy Chief of Staff of the Army, G-3/5/7
- G-4** Deputy Chief of Staff of the Army, G-4
- NCFA** National Commission on the Future of the Army
- ORF** Operational Readiness Float
- RCF** Repair Cycle Float



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U.S. DEPARTMENT OF DEFENSE

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