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## Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-278



### **CH-47F Improved Cargo Helicopter (CH-47F)**

As of FY 2019 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## **Sensitivity Originator**

No originator info Available at this time.

## Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance  
ACAT - Acquisition Category  
ADM - Acquisition Decision Memorandum  
APB - Acquisition Program Baseline  
APPN - Appropriation  
APUC - Average Procurement Unit Cost  
\$B - Billions of Dollars  
BA - Budget Authority/Budget Activity  
Blk - Block  
BY - Base Year  
CAPE - Cost Assessment and Program Evaluation  
CARD - Cost Analysis Requirements Description  
CDD - Capability Development Document  
CLIN - Contract Line Item Number  
CPD - Capability Production Document  
CY - Calendar Year  
DAB - Defense Acquisition Board  
DAE - Defense Acquisition Executive  
DAMIR - Defense Acquisition Management Information Retrieval  
DoD - Department of Defense  
DSN - Defense Switched Network  
EMD - Engineering and Manufacturing Development  
EVM - Earned Value Management  
FOC - Full Operational Capability  
FMS - Foreign Military Sales  
FRP - Full Rate Production  
FY - Fiscal Year  
FYDP - Future Years Defense Program  
ICE - Independent Cost Estimate  
IOC - Initial Operational Capability  
Inc - Increment  
JROC - Joint Requirements Oversight Council  
\$K - Thousands of Dollars  
KPP - Key Performance Parameter  
LRIP - Low Rate Initial Production  
\$M - Millions of Dollars  
MDA - Milestone Decision Authority  
MDAP - Major Defense Acquisition Program  
MILCON - Military Construction  
N/A - Not Applicable  
O&M - Operations and Maintenance  
ORD - Operational Requirements Document  
OSD - Office of the Secretary of Defense  
O&S - Operating and Support  
PAUC - Program Acquisition Unit Cost

PB - President's Budget  
PE - Program Element  
PEO - Program Executive Officer  
PM - Program Manager  
POE - Program Office Estimate  
RDT&E - Research, Development, Test, and Evaluation  
SAR - Selected Acquisition Report  
SCP - Service Cost Position  
TBD - To Be Determined  
TY - Then Year  
UCR - Unit Cost Reporting  
U.S. - United States  
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

## Program Information

**Program Name**

CH-47F Improved Cargo Helicopter (CH-47F)

**DoD Component**

Army

## Responsible Office

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**Date Assigned:** June 29, 2017

## References

**SAR Baseline (Production Estimate)**

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated November 22, 2004

**Approved APB**

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated April 22, 2010



## Mission and Description

The CH-47F Improved Cargo Helicopter (CH-47F) supports the Army's requirement to be strategically responsive across the full spectrum of operations. It provides continued support, coverage and sustainment of Maneuver, Fire Support, Air Defense and Survivability mission areas. Its mission is to transport ground forces, fuel and ammunition supplies and other battle critical cargo in support of all future contingencies. The CH-47F enables the Army to support the rapid response capability necessary for forcible and early entry contingency missions, as well as tactical and operational nonlinear, noncontiguous, simultaneous or sequential operations, which will be characteristic of future operations.

The CH-47F is a future force system that supports the Army Vision. The CH-47F is a twin-turbine, tandem-rotor, heavy-lift transport helicopter with a useful payload of up to 25,000 pounds. The CH-47F's lift capability is invaluable as the Army transforms from a heavy-division dominated force to a more deployable medium weight force focused toward 21st Century Army requirements. The CH-47F, with its upgraded engines, the Common Avionics Architecture System (CAAS) with advanced avionics, monolithic machined frame components and airframe modifications, will reduce operating costs and continue to be a National asset providing peacetime disaster relief and wartime service to this country for another 20 years.

The CH-47F program fills the Army's Aviation Transformation Chinook requirement for upgraded aircraft and is comprised of both remanufactured and new aircraft. The total remanufactured aircraft will consist of CH-47Fs and MH-47Gs. The MH-47G configuration replaces the current MH-47E/Ds for Special Operations Forces. The CH-47F program installs a new digital cockpit, incorporates all new airframe components and modifies the aircraft to reduce vibration. The CAAS digital cockpit will provide future growth potential. It includes a digital data bus which permits installation of enhanced communications and navigation equipment for improved situational awareness, mission performance and survivability. New airframe structural components and modifications reduce harmful vibrations, improving O&S efficiency and crew endurance. Other airframe modifications reduce the time required for aircraft tear down and build-up during C-5/C-17 deployment by 60 percent. These modifications significantly enhance the CH-47F's strategic deployment capability.



## Executive Summary

This is the final SAR submission for the CH-47F program.

Pursuant to section 2432 of title 10, U.S. Code, this is the final SAR submission for the CH-47F Improved Cargo Helicopter, because the program is 90% or more expended and 90% or more delivered.

The CH-47F program is in FRP and remains on schedule with a total of 536 aircraft on contract to date (two RDT&E, 467 CH-47F (246 New Build and 221 ReNew) and 67 MH-47G). The final CH-47F procurement is planned for FY 2018.

The first lot of the Multi-Year II contract (Lot 11) was awarded on June 10, 2013, the second lot (Lot 12) was awarded on December 26, 2013, the third lot (Lot 13) was awarded on March 13, 2015, the fourth lot (Lot 14) was awarded on March 15, 2016 and the fifth and final lot (Lot 15) was awarded on April 28, 2017. The first Multi-Year II delivery occurred ahead of schedule on January 29, 2015. A total of 491 aircraft have been delivered as of December 31, 2017 (two RDT&E aircraft, 422 CH47F and 67 MH-47G). The FY 2013 Overseas Contingency Operations (OCO) funds of \$231.3M were received in June 2013 for six CH-47F aircraft. The FY 2014 OCO funds of \$386.0M were received in March 2014 for ten CH-47F aircraft. On December 23, 2014, an ADM following an Army CH-47 Configuration Steering Board increased the CH-47F Army Acquisition Objective from 533 to 542. In January 2015, \$347.4M in FY 2014 OCO funds for nine aircraft was rescinded.

The CH-47F Product Management Office (PMO) is tasked by the Army to continue CH-47F training of Active Component (AC), Army National Guard (ARNG), and U.S. Army Reserve (USAR) Combat Aviation Brigades (CAB) via New Equipment Training (NET) through FY 2019. The CH-47F NET teams completed fielding and training of all 13 AC CABs, the five CH-47F equipped Honduras-based Joint Task Force Bravo, 13 ARNG CABs and the USAR CABs. The PMO supports multiple contractor NET teams who provide concurrent training as new hardware/software enhancements are fielded.

The NET completed training and fielding of the first Multi-Year II configured aircraft to the 1st Armored Division in July 2015, the 1-214th Aviation Regiment (Germany) in August 2015, the 3rd Infantry Division in March 2016, the 82nd Airborne Division in July 2016, the 10th Mountain Division in December 2016, the 101st Airborne Division in March 2017, the 4th CAB in August 2017, the 1st CAB in November 2017, the 25th CAB is scheduled in 1st Quarter FY 2019 and the 2nd CAB is scheduled in 4th Quarter FY 2019.

Two CH-47F equipped CABs are currently deployed to Operation Freedom Sentinel and one CH-47F equipped CAB is deployed to Operation Inherent Resolve.

The CH-47F PMO completed installation of Infrared Suppression System, Advanced Threat Infrared Counter Measures and other Army-directed modifications at the Millville, New Jersey modification center.

The CH-47F requirements are stable and funding is adequate to meet cost, schedule and performance objectives established in the current approved APB. There are no increased risks to the CH-47F since the last SAR.

There are no significant software-related issues with this program at this time.

## Threshold Breaches

### APB Breaches

<b>Schedule</b>		<input type="checkbox"/>
<b>Performance</b>		<input type="checkbox"/>
<b>Cost</b>	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
<b>O&amp;S Cost</b>		<input type="checkbox"/>
<b>Unit Cost</b>	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

### Nunn-McCurdy Breaches

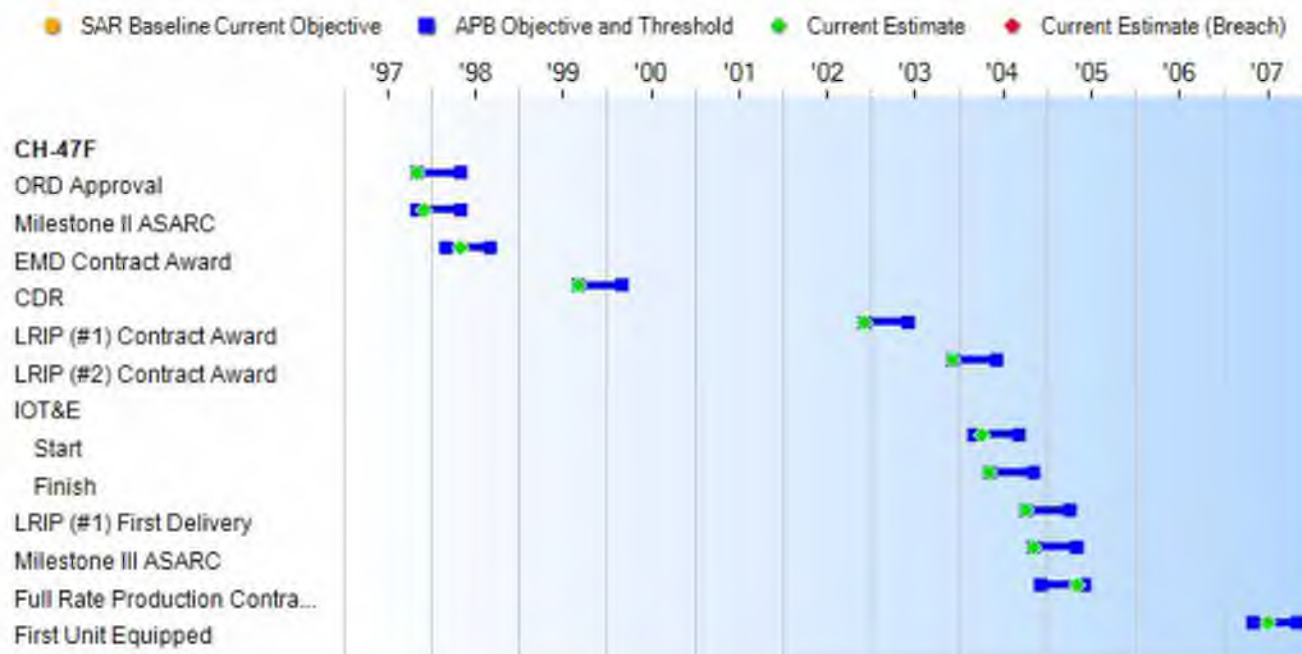
#### Current UCR Baseline

PAUC	None
APUC	None

#### Original UCR Baseline

PAUC	None
APUC	None

## Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
ORD Approval	Nov 1997	Nov 1997	May 1998	Nov 1997
Milestone II ASARC	Nov 1997	Nov 1997	May 1998	Dec 1997
EMD Contract Award	Mar 1998	Mar 1998	Sep 1998	May 1998
CDR	Sep 1999	Sep 1999	Mar 2000	Sep 1999
LRIP (#1) Contract Award	Dec 2002	Dec 2002	Jun 2003	Dec 2002
LRIP (#2) Contract Award	Dec 2003	Dec 2003	Jun 2004	Dec 2003
IOT&E				
Start	Mar 2004	Mar 2004	Sep 2004	Apr 2004
Finish	May 2004	May 2004	Nov 2004	May 2004
LRIP (#1) First Delivery	Oct 2004	Oct 2004	Apr 2005	Oct 2004
Milestone III ASARC	Nov 2004	Nov 2004	May 2005	Nov 2004
Full Rate Production Contract Award	Dec 2004	Dec 2004	Jun 2005	May 2005
First Unit Equipped	May 2007	May 2007	Nov 2007	Jul 2007

**Change Explanations**

None

**Notes**

The IOT&E is a single effort divided into two phases. Phase I, completed in May 2004, supported FRP. Phase II, completed in June 2007, supported First Unit Equipped.

**Acronyms and Abbreviations**

ASARC - Army Systems Acquisition Review Council

CDR - Critical Design Review

IOT&E - Initial Operational Test and Evaluation



## Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
Self-deploy w/30 min fuel reserve (nm)				
1260	1260	1056	1130	1130
Transport 16,000 lbs of internal/external cargo (nm)				
100	100	50	56	56
Transport combat equipped troops:				
Number of Troops				
44	44	31	31	31
Range (nm)				
150	150	100	150	150
Reliability:				
MTBEMA (flt hrs)				
3.5	3.5	3.3	6.0	3.3
Maintenance:				
Total Maintenance Ratio (mmh/flt hr)				
9.2	9.2	9.8	2.91	9.8

### Requirements Reference

ORD Revision 4 dated January 26, 2006

### Change Explanations

None

### Notes

Per new guidance from DoD Acquisition Visibility, O&S/Sustainment Reporting Functional Description Document Version 3.0, the definitions of Demonstrated Performance and Current Estimate are:

**Demonstrated Performance:** The Demonstrated Performance section of Reliability and Maintenance is actual data derived from the current Aviation and Missile Research Development and Engineering Center Aviation System Assessment Program reliability data system for the lifetime of the CH-47F model, consistent with reporting by other Army Aviation platforms. With this report, phase maintenance is excluded from the values per Training & Doctrine Command memo.

**Current Estimate:** The Current Estimate represents anticipated performance when all units are fielded. The Current Estimates for Reliability and Maintenance correspond to the CH-47F ORD values.

CH-47F Operational Test completed on June 4, 2007. RAM data final scoring conference completed on June 5, 2007.

**Acronyms and Abbreviations**

flt - flight  
hr(s) - hour(s)  
lbs - pounds  
min - minute  
mmh - maintenance man hour  
MTBEMA - Mean Time Between Essential Maintenance Actions  
nm - nautical miles  
RAM - Reliability, Availability, Maintainability  
w/ - with

## Track to Budget

### RDT&E

Appn	BA	PE	
Army	2040	07	0203744A
Project	Name		
D430	Aircraft Modifications/Product Improvement Program/Improved Cargo Helicopter		
			(Sunk)

### Procurement

Appn	BA	PE
Army	2031	01 0210104A
Line Item	Name	
A05008	CH-47 NEW BUILD (Sunk)	
Notes:	The CH-47F funding lines changed starting in FY 2010 to CH-47 Helicopter (A05101) - a parent (roll-up) of New Build and Service Life Extension Program (SLEP), CH-47 SLEP (A05105) and CH-47 New Build (A05008). CH-47F funding for FY 2009 and prior resides on the previously combined AA0252 line. A05008 and A05105 fund the CH-47F aircraft and post-production modification efforts.	
A05105	CH-47 SLEP (Sunk)	
Notes:	The CH-47F funding lines changed starting in FY 2010 to CH-47 Helicopter (A05101) - a parent (roll-up) of New Build and Service Life Extension Program (SLEP), CH-47 SLEP (A05105) and CH-47 New Build (A05008). CH-47F funding for FY 2009 and prior resides on the previously combined AA0252 line. A05008 and A05105 fund the CH-47F aircraft and post-production modification efforts.	
Army	2031	02 0210104A
Line Item	Name	
AA0252	CH-47 CARGO HELICOPTER MODS (Sunk)	
Notes:	Line Item AA0252 is shared with CH-47D Modifications applied to currently fielded CH-47D aircraft.	



## Cost and Funding

### Cost Summary

Total Acquisition Cost						
Appropriation	BY 2005 \$M			BY 2005 \$M	TY \$M	
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective
RDT&E	179.7	183.3	201.6	183.3	171.0	171.6
Procurement	10435.1	11869.0	13055.9	12663.0	11976.4	13464.6
Flyaway	--	--	--	11909.7	--	--
Recurring	--	--	--	11570.5	--	--
Non Recurring	--	--	--	339.2	--	--
Support	--	--	--	753.3	--	--
Other Support	--	--	--	702.4	--	--
Initial Spares	--	--	--	50.9	--	--
MILCON	0.0	0.0	--	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0
Total	10614.8	12052.3	N/A	12846.3	12147.4	13636.2

#### Cost Notes

In accordance with Section 842 of the National Defense Authorization Act for FY 2017, which amended title 10 U.S.C. § 2334, the Director of Cost Assessment and Program Evaluation, and the Secretary of the military department concerned or the head of the Defense Agency concerned, must issue guidance requiring a discussion of risk, the potential impacts of risk on program costs, and approaches to mitigate risk in cost estimates for MDAPs and major subprograms. The information required by the guidance is to be reported in each SAR. This guidance is not yet available; therefore, the information on cost risk is not contained in this SAR.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	2	2	2
Procurement	510	523	536
Total	512	525	538

## Cost and Funding

### Funding Summary

Appropriation Summary									
FY 2019 President's Budget / December 2017 SAR (TY\$ M)									
Appropriation	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
RDT&E	171.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	171.6
Procurement	14348.1	131.8	0.0	0.0	0.0	0.0	0.0	0.0	14479.9
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2019 Total	14519.7	131.8	0.0	0.0	0.0	0.0	0.0	0.0	14651.5
PB 2018 Total	14528.4	131.8	0.0	0.0	0.0	0.0	0.0	0.0	14660.2
Delta	-8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-8.7

Quantity Summary										
FY 2019 President's Budget / December 2017 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	534	2	0	0	0	0	0	0	536
PB 2019 Total	2	534	2	0	0	0	0	0	0	538
PB 2018 Total	2	534	2	0	0	0	0	0	0	538
Delta	0	0	0	0	0	0	0	0	0	0

## Cost and Funding

### Annual Funding By Appropriation

Annual Funding							
2040   RDT&E   Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1995	--	--	--	--	--	--	2.7
1996	--	--	--	--	--	--	4.3
1997	--	--	--	--	--	--	16.6
1998	--	--	--	--	--	--	22.6
1999	--	--	--	--	--	--	23.8
2000	--	--	--	--	--	--	27.1
2001	--	--	--	--	--	--	37.7
2002	--	--	--	--	--	--	17.7
2003	--	--	--	--	--	--	3.3
2004	--	--	--	--	--	--	7.3
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	7.0
2007	--	--	--	--	--	--	1.5
Subtotal	2	--	--	--	--	--	171.6



Annual Funding 2040   RDT&E   Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	BY 2005 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1995	--	--	--	--	--	--	3.1
1996	--	--	--	--	--	--	4.8
1997	--	--	--	--	--	--	18.4
1998	--	--	--	--	--	--	24.9
1999	--	--	--	--	--	--	25.9
2000	--	--	--	--	--	--	29.1
2001	--	--	--	--	--	--	39.9
2002	--	--	--	--	--	--	18.5
2003	--	--	--	--	--	--	3.4
2004	--	--	--	--	--	--	7.3
2005	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	6.6
2007	--	--	--	--	--	--	1.4
Subtotal	2	--	--	--	--	--	183.3

Annual Funding							
2031   Procurement   Aircraft Procurement, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	41.6	41.6	17.7	59.3
2002	--	--	--	45.5	45.5	14.9	60.4
2003	14	353.8	--	224.8	578.6	18.6	597.2
2004	16	227.8	--	--	227.8	23.2	251.0
2005	30	700.3	--	4.6	704.9	15.0	719.9
2006	24	461.4	--	2.6	464.0	40.6	504.6
2007	43	1121.7	--	13.3	1135.0	88.3	1223.3
2008	53	1253.8	--	--	1253.8	60.4	1314.2
2009	52	1216.3	--	--	1216.3	57.3	1273.6
2010	39	852.2	--	--	852.2	76.1	928.3
2011	49	1198.9	--	--	1198.9	113.7	1312.6
2012	48	1352.5	--	--	1352.5	20.0	1372.5
2013	44	1104.0	--	--	1104.0	98.9	1202.9
2014	29	824.2	--	--	824.2	87.7	911.9
2015	32	896.7	--	--	896.7	63.3	960.0
2016	39	1073.8	--	--	1073.8	29.3	1103.1
2017	22	520.4	--	--	520.4	32.9	553.3
2018	2	131.4	--	--	131.4	0.4	131.8
Subtotal	536	13289.2	--	332.4	13621.6	858.3	14479.9

Annual Funding							
2031   Procurement   Aircraft Procurement, Army							
Fiscal Year	Quantity	BY 2005 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	43.9	43.9	18.7	62.6
2002	--	--	--	47.4	47.4	15.5	62.9
2003	14	360.5	--	228.9	589.4	19.0	608.4
2004	16	225.8	--	--	225.8	22.9	248.7
2005	30	675.4	--	4.4	679.8	14.5	694.3
2006	24	433.2	--	2.4	435.6	38.2	473.8
2007	43	1032.4	--	12.2	1044.6	81.4	1126.0
2008	53	1136.0	--	--	1136.0	54.7	1190.7
2009	52	1086.4	--	--	1086.4	51.2	1137.6
2010	39	748.2	--	--	748.2	66.8	815.0
2011	49	1033.8	--	--	1033.8	98.0	1131.8
2012	48	1146.8	--	--	1146.8	17.0	1163.8
2013	44	920.0	--	--	920.0	82.4	1002.4
2014	29	676.8	--	--	676.8	72.0	748.8
2015	32	725.8	--	--	725.8	51.3	777.1
2016	39	858.8	--	--	858.8	23.5	882.3
2017	22	409.2	--	--	409.2	25.9	435.1
2018	2	101.4	--	--	101.4	0.3	101.7
Subtotal	536	11570.5	--	339.2	11909.7	753.3	12663.0

Cost Quantity Information		
2031   Procurement   Aircraft Procurement, Army		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2005 \$M
2001	--	--
2002	--	--
2003	14	348.3
2004	16	224.9
2005	30	672.1
2006	24	415.6
2007	43	1037.8
2008	53	1133.7
2009	52	1077.0
2010	39	746.7
2011	49	1016.7
2012	48	1092.3
2013	44	949.4
2014	29	654.1
2015	32	713.7
2016	39	871.7
2017	22	503.2
2018	2	113.3
Subtotal	536	11570.5



## Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
<b>Approval Date</b>	5/19/1998	8/19/2002
<b>Approved Quantity</b>	30	30
<b>Reference</b>	Milestone II ADM	LRIP ADM
<b>Start Year</b>	2003	2003
<b>End Year</b>	2004	2004

Milestone II and LRIP ADMs specified LRIP quantity as "up to 30 aircraft."

The FY 2003 PB funded 23 LRIP aircraft (seven in FY 2003 and 16 in FY 2004). Of these, one aircraft in FY 2003 was a CH-47F and the remaining 22 were MH-47G.

## Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
Saudi Arabia	5/30/2017	8	276.0	An additional five aircraft, with a value of \$151.3M, were added to this case in September 2015.
Netherlands	11/12/2015	14	492.5	
United Arab Emirates	6/28/2011	16	598.7	
Turkey	7/9/2010	11	403.3	
Australia	3/19/2010	7	249.0	

### Notes

The sale dates above are Letter Of Acceptance signature dates. The costs are for the aircraft only.

The CH-47F aircraft capabilities and operational successes in Operation Iraqi Freedom and Operation Enduring Freedom generated interest and inquiries from foreign CH-47D customers. The Common Avionics Architecture System (CAAS) cockpit provides pilot workload reductions and enhanced flight capabilities through flight control coupling. Foreign customers requesting configuration modifications to the aircraft which change the CAAS software, aircraft handling qualities, mission equipment or performance incur non-recurring and recurring costs to develop, test, qualify, certify, field and maintain the software and related hardware as well as increase the lead time to deliver the modified CH-47F. The FMS helps ensure a robust supply chain and industrial base.

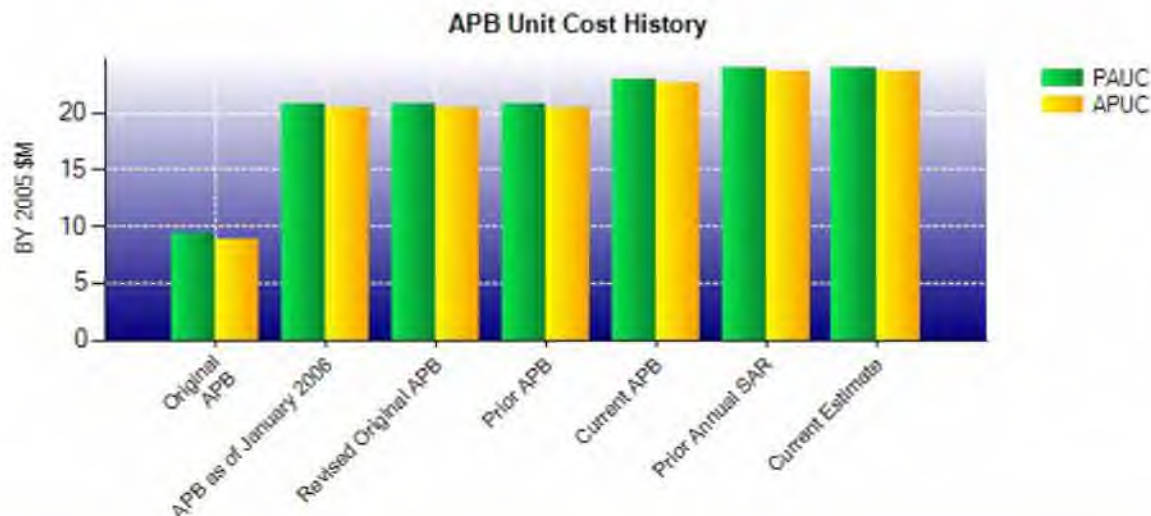
## Nuclear Costs

None

**Unit Cost**

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2005 \$M	BY 2005 \$M	% Change
	Current UCR Baseline (Apr 2010 APB)	Current Estimate (Dec 2017 SAR)	
Program Acquisition Unit Cost			
Cost	12052.3	12846.3	
Quantity	525	538	
Unit Cost	22.957	23.878	+4.01
Average Procurement Unit Cost			
Cost	11869.0	12663.0	
Quantity	523	536	
Unit Cost	22.694	23.625	+4.10
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2005 \$M	BY 2005 \$M	% Change
	Revised Original UCR Baseline (Nov 2004 APB)	Current Estimate (Dec 2017 SAR)	
Program Acquisition Unit Cost			
Cost	10614.8	12846.3	
Quantity	512	538	
Unit Cost	20.732	23.878	+15.17
Average Procurement Unit Cost			
Cost	10435.1	12663.0	
Quantity	510	536	
Unit Cost	20.461	23.625	+15.46





APB Unit Cost History					
Item	Date	BY 2005 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	May 1998	9.283	8.840	10.316	9.909
APB as of January 2006	Nov 2004	20.732	20.461	23.725	23.483
Revised Original APB	Nov 2004	20.732	20.461	23.725	23.483
Prior APB	Nov 2004	20.732	20.461	23.725	23.483
Current APB	Apr 2010	22.957	22.694	25.974	25.745
Prior Annual SAR	Dec 2016	23.872	23.619	27.249	27.031
Current Estimate	Dec 2017	23.878	23.625	27.233	27.015

### SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.316	-0.491	3.003	-0.164	2.273	7.378	0.000	1.410	13.409	23.725

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
23.725	-0.191	0.304	-0.667	0.410	3.316	0.000	0.336	3.508	27.233

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
9.909	-0.487	3.180	-0.171	2.282	7.354	0.000	1.416	13.574	23.483

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
23.483	-0.190	0.318	-0.669	0.410	3.326	0.000	0.337	3.532	27.015

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	Nov 1997	Nov 1997	Dec 1997
Milestone III	N/A	Jan 2004	Nov 2004	Nov 2004
FUE	N/A	Sep 2004	May 2007	Jul 2007
Total Cost (TY \$M)	N/A	3115.4	12147.4	14651.5
Total Quantity	N/A	302	512	538
PAUC	N/A	10.316	23.725	27.233

**Cost Variance**

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	171.0	11976.4	--	12147.4
Previous Changes				
Economic	-0.9	-89.6	--	-90.5
Quantity	--	+780.5	--	+780.5
Schedule	--	-358.7	--	-358.7
Engineering	+0.5	+219.9	--	+220.4
Estimating	+1.0	+1779.9	--	+1780.9
Other	--	--	--	--
Support	--	+180.2	--	+180.2
Subtotal	+0.6	+2512.2	--	+2512.8
Current Changes				
Economic	--	-12.4	--	-12.4
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	+3.1	--	+3.1
Other	--	--	--	--
Support	--	+0.6	--	+0.6
Subtotal	--	-8.7	--	-8.7
Total Changes	+0.6	+2503.5	--	+2504.1
CE - Cost Variance	171.6	14479.9	--	14651.5
CE - Cost & Funding	171.6	14479.9	--	14651.5



Summary BY 2005 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	179.7	10435.1	--	10614.8
Previous Changes				
Economic	--	--	--	--
Quantity	--	+637.5	--	+637.5
Schedule	--	-44.6	--	-44.6
Engineering	+0.5	+178.7	--	+179.2
Estimating	+3.1	+1294.7	--	+1297.8
Other	--	--	--	--
Support	--	+158.4	--	+158.4
Subtotal	+3.6	+2224.7	--	+2228.3
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	+2.5	--	+2.5
Other	--	--	--	--
Support	--	+0.7	--	+0.7
Subtotal	--	+3.2	--	+3.2
Total Changes	+3.6	+2227.9	--	+2231.5
CE - Cost Variance	183.3	12663.0	--	12846.3
CE - Cost & Funding	183.3	12663.0	--	12846.3

Previous Estimate: December 2016



Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-12.4
Reallocation of MH-47G long lead from the CH-47F program to the CH-47F Block II program. (Estimating)	-6.8	-8.6
Adjustment for current and prior escalation. (Estimating)	+9.3	+11.7
Adjustment for current and prior escalation. (Support)	+0.7	+0.6
Procurement Subtotal	+3.2	-8.7

## Contracts

### Contract Identification

**Appropriation:** Procurement  
**Contract Name:** Multiyear II  
**Contractor:** Boeing Helicopter  
**Contractor Location:** Philadelphia, PA 19142  
**Contract Number:** W58RGZ-13-C-0002  
**Contract Type:** Firm Fixed Price (FFP)  
**Award Date:** June 10, 2013  
**Definitization Date:** June 10, 2013

### Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
916.5	N/A	37	4845.0	N/A	205	4845.0	4845.0

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the increase in number of aircraft on contract and the application of Engineering Change Proposals.

### Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FFP) contract.

## Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	2	100.00%
Production	470	489	536	91.23%
Total Program Quantity Delivered	472	491	538	91.26%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	14651.5	Years Appropriated	24
Expended to Date	13517.9	Percent Years Appropriated	100.00%
Percent Expended	92.26%	Appropriated to Date	14651.5
Total Funding Years	24	Percent Appropriated	100.00%

The above data is current as of February 12, 2018.



## Operating and Support Cost

### Cost Estimate Details

<b>Date of Estimate:</b>	January 30, 2018
<b>Source of Estimate:</b>	POE
<b>Quantity to Sustain:</b>	449
<b>Unit of Measure:</b>	Aircraft
<b>Service Life per Unit:</b>	20.00 Years
<b>Fiscal Years in Service:</b>	FY 2007 - FY 2040

The O&S costs are from the January 2018 POE which is based on methodology used in the 2004 CH-47F Army Cost Position. It assumes an end state of 449 CH-47F operational aircraft when fully fielded flying 180 peacetime hours per aircraft per year. While the common production costs of 66 MH-47Gs are included in the procurement costs, they are excluded from the O&S costs as they are managed by the Special Operations Aviation Regiment. The remaining aircraft are two RDT&E-funded aircraft and 21 peacetime attrition aircraft that incur no O&S costs due to no flying hours or are wartime replacement aircraft whose flying hours are already accounted.

### Sustainment Strategy

The CH-47F weapons system follows the standard Army maintenance program, which is broken down into two levels of maintenance: Field and Sustainment. Field maintenance is performed by Combat Aviation Brigade personnel assigned to flight companies, aviation maintenance companies, and aviation support companies. Sustainment maintenance support is divided and primarily performed by three separate entities: the Original Equipment Manufacturers (OEM) and their contractor field service representatives; Army depots located at fixed bases in the continental United States and by the national maintenance sources of repair.

CH-47F Line Replaceable Units (LRU) are provisioned and available via the Army Supply System. These LRUs are organically supported, including the capability to perform aviation intermediate maintenance repair on Rockwell Collins components at Tobyhanna Army Depot, Pennsylvania. Some components, such as the main rotor blade, are supported via a Performance Based Logistics contract with the OEM.

The CH-47F has a robust depot maintenance program in place, with 83 Depot Maintenance Work Requirements established and nine others in progress. Collaboration with Corpus Christi, Texas and Tobyhanna Army Depots bolster sustainment coverage for supply support at field and sustainment maintenance levels. The availability of repair data for on-going efforts has reduced risk towards achieving sustainment requirements.

The CH-47F costs are based on CH-47D actuals extracted from the O&S Management Information System (OSMIS). To calculate the CH-47F costs, the CH-47D actuals were augmented by an improvement factor to account for the increased reliability of recapitalized parts, new airframe and vibration engineering.

### Antecedent Information

The antecedent to the CH-47F is the CH-47D, for which the O&S costs are from the CH-47D model POE. The total O&S cost is based on 306 systems with an operating span of 20 years peacetime operating tempo spanning FY 1997 to FY 2018. The O&S costs are based on actuals extracted from OSMIS.

Annual O&S Costs BY2005 \$K		
Cost Element	CH-47F Average Annual Cost Per Aircraft	CH-47D (Antecedent) Average Annual Operating Cost Per Aircraft
Unit-Level Manpower	401.000	659.000
Unit Operations	69.000	76.000
Maintenance	1157.000	1209.000
Sustaining Support	19.000	470.000
Continuing System Improvements	207.000	11.000
Indirect Support	99.000	652.000
Other	0.000	0.000
Total	1952.000	3077.000

Item	Total O&S Cost \$M			
	CH-47F			CH-47D (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	16379.4	18017.3	17530.8	18837.0
Then Year	22285.6	N/A	24313.0	0.0

Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program.

#### Equation to Translate Annual Cost to Total Cost

Total cost = Average annual cost per aircraft x quantity x service life = \$1952.2K x 449 x 20 = \$17530.8M.

O&S Cost Variance		
Category	BY 2005 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2016 SAR	17530.8	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	17530.8	

#### Disposal Estimate Details

Date of Estimate: January 30, 2018



**Source of Estimate:**

POE

**Disposal/Demilitarization Total Cost (BY 2005 \$M):**

Total costs for disposal of all Aircraft are 6.5