Selected Acquisition Report (SAR)

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

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

As of FY 2015 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations

Acq O&M - Acquisition-Related Operations and Maintenance
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
BA - Budget Authority/Budget Activity
BY - Base Year
DAMIR - Defense Acquisition Management Information Retrieval
Dev Est - Development Estimate
DoD - Department of Defense
DSN - Defense Switched Network
Econ - Economic
Eng - Engineering
Est - Estimating
FMS - Foreign Military Sales
FY - Fiscal Year
IOC - Initial Operational Capability
$K - Thousands of Dollars
LRIP - Low Rate Initial Production
$M - Millions of Dollars
MILCON - Military Construction
N/A - Not Applicable
O&S - Operating and Support
Oth - Other
PAUC - Program Acquisition Unit Cost
PB - President's Budget
PE - Program Element
Proc - Procurement
Prod Est - Production Estimate
QR - Quantity Related
Qty - Quantity
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
Sch - Schedule
Spt - Support
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting

Program Information

Program Name

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

DoD Component

Army

Responsible Office

Responsible Office

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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 will provide continued support, coverage, and sustainment of Maneuver, Fire Support, Air Defense, and Survivability mission areas. Its mission is transportation of ground forces, Class III/Class V 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 load 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 the special operations. 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 that permits installation of enhanced communications and navigation equipment for improved situational awareness, mission performance, and survivability. New airframe structural components and modifications will 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

The CH-47F program is in full rate production and remains on schedule with 373 CH-47F aircraft on contract (227 New Build and 146 ReNew). The first lot of the Multiyear II contract (Lot 11) was awarded on June 10, 2013, and the second lot of the Multiyear II contract (Lot 12) was awarded on December 26, 2013. A total of 332 aircraft have been delivered as of February 27, 2014 (273 CH47Fs and 59 MH-47Gs). FY 2013 Overseas Contingency Operations (OCO) funds of $231.3M were received in June 2013 for six CH-47F aircraft. FY 2014 OCO funds of $386.0M were received in March 2014 for ten CH-47F aircraft.

The CH-47F Product Manager's Office (PMO) is tasked by Department of the Army to continue CH-47F training of Active Component, National Guard and Reserve Component Combat Aviation Brigades (CAB) via New Equipment Training (NET) through FY 2015. NET Team #1 completed NET of the 1st Infantry Division (ID) CAB (14th Unit Equipped), Fort Riley, Kansas, on May 3, 2013, and relocated to Camp Humphreys, Korea. Net Team #1 began NET for 2ID CAB (18th Unit Equipped) in January 2014. All 2ID CAB aircraft have completed aircraft modification, including installation of the new Cargo On/Off Loading System and are in position at Camp Humphreys ready to begin flight training operations. At the conclusion of 2ID CAB NET, Team #1 will relocate to Olathe, Kansas to begin Reserve unit NET.

The NET Team #2 completed NET of the Nebraska/Colorado National Guard (16th Unit Equipped) on May 21, 2013, as well as the Ohio/Michigan National Guard (17th Unit Equipped) on August 30, 2013. NET Team #2 has relocated to Fort Carson, Colorado and began NET for 4ID CAB (19th Unit Equipped) in January 2014. At the completion of 4ID CAB NET, Team #2 will relocate to Hunter Army Airfield in Savannah, Georgia to begin National Guard unit NET.

At the conclusion of NET operations for the 2ID and 4ID CABs, all Active Component CABs will have completed fielding and CH-47F NET training.

Two CH-47F units are currently deployed to Operation Enduring Freedom.

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

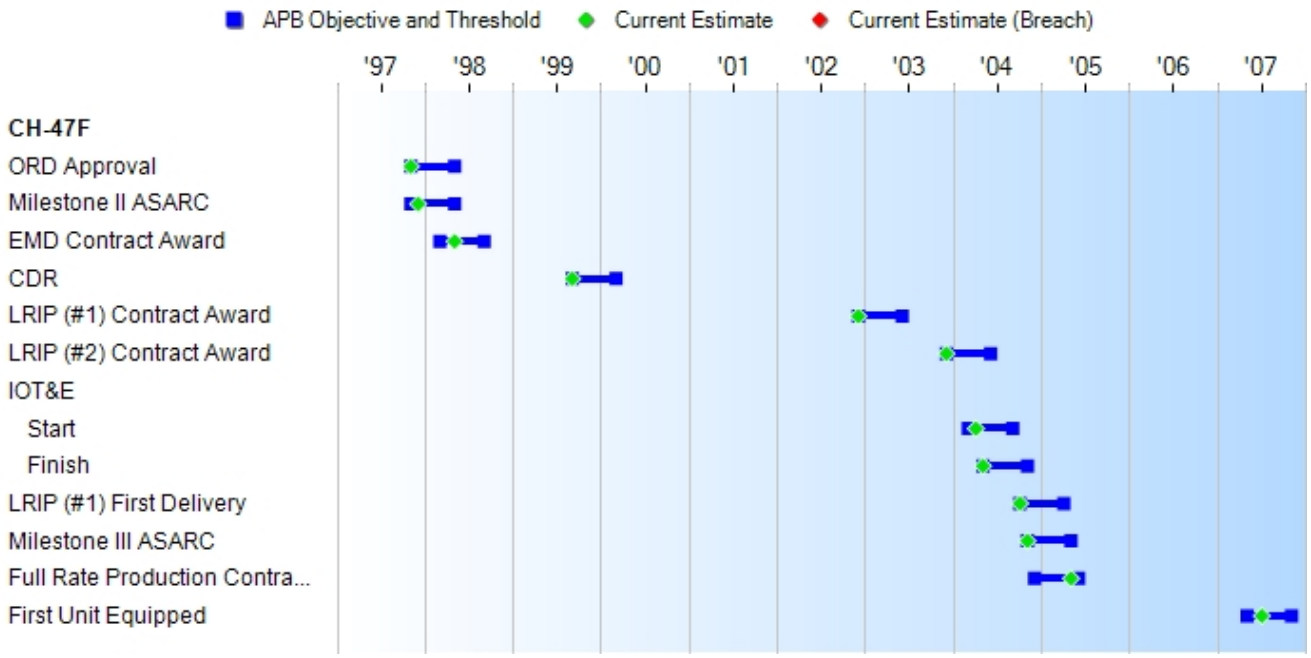
There are no significant software-related issues with this program at this time.

Threshold Breaches

APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule



Milestones	SAR Baseline Prod Est	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

Memo

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

Acronyms and Abbreviations

ASARC - Army Systems Acquisition Review Council
CDR - Critical Design Review
EMD - Engineering and Manufacturing Development
IOT&E - Initial Operational Test and Evaluation
ORD - Operational Requirements Document

Performance

Characteristics	SAR Baseline Prod Est	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	3.66	3.3	(Ch-1)
Maintenance:						
Total Maintenance Ratio (mmh/flt hr)	9.2	9.2	9.8	2.91	9.8	(Ch-2)

Requirements Source

Operational Requirements Document (ORD) Revision 4 dated January 26, 2006

Change Explanations

(Ch-1) The Current Estimate for Reliability (MTBEMA) changed from 3.48 to 3.3 to correspond to the CH-47F ORD values.

(Ch-2) The Current Estimate for Maintenance (Total Maintenance Ratio) changed from 2.71 to 9.8 to correspond to the CH-47F ORD values.

Memo

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

Per new guidance from DoD Acquisition Visibilty, O&S/Sustainment Reporting FDD Version 3.0, the defintions of Demonstrated Performance and Current Estimate are as follows:

Demonstrated Performance: The Demonstrated Performance section of Reliability and Maintenance is actual data derived from the current AMRDEC CH-47 RAM Report and the AMSAA, Aviation System Usage/Parts Replacement Analysis.

Current Estimate: The current estimate represents anticipated performance once all units are fielded. The current estimates for Reliability and Maintenance correspond to the CH-47F ORD values.

Acronyms and Abbreviations

AMRDEC - Aviation and Missile Research Development and Engineering Center
AMSAA - Army Material Systems Analysis Activity
FDD - Functional Design Document
flt - flight
hr(s) - hour(s)
lbs - pounds
min - minutes
mmh - maintenance man hour
MTBEMA - Mean Time Between Essential Maintenance Actions
nm - nautical miles
ORD - Operational Requirements Document
RAM - Reliability and Maintainability
w/ - with

Track to Budget

General Memo

Line Item AA0252 is shared with CH-47D Modifications applied to currently fielded CH-47D aircraft. The CH-47F's funding lines changed starting in FY 2010 to CH-47 Helicopter (A05101) - a parent (rollup) 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.

RDT&E

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

Procurement

Appn		BA	PE		
Army	2031	01	0210104A		
	Line Item		**Name**		
	A05008		CH-47 NEW BUILD	(Shared)	
Army	2031	01			
	Line Item		**Name**		
	A05105		CH-47 SLEP	(Shared)	
Army	2031	02			
	Line Item		**Name**		
	AA0252		CH-47 CARGO HELICOPTER MODS	(Shared)	(Sunk)

A05008 and A05105 fund other aircraft modification efforts.

Cost and Funding

Cost Summary

Total Acquisition Cost and Quantity

Appropriation	BY2005 $M			BY2005 $M	TY $M		
	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Prod Est	Current APB Production Objective	Current Estimate
RDT&E	179.7	183.3	201.6	183.3	171.0	171.6	171.6
Procurement	10435.1	11869.0	13055.9	12899.0	11976.4	13464.6	14846.7
Flyaway	--	--	--	12130.7	--	--	13965.0
Recurring	--	--	--	11791.5	--	--	13632.6
Non Recurring	--	--	--	339.2	--	--	332.4
Support	--	--	--	768.3	--	--	881.7
Other Support	--	--	--	706.3	--	--	808.1
Initial Spares	--	--	--	62.0	--	--	73.6
MILCON	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
Total	10614.8	12052.3	N/A	13082.3	12147.4	13636.2	15018.3

Confidence Level for Current APB Cost 50% -

The Confidence Level of the CH-47F APB cost estimate, which was approved on April 22, 2010, is 50% in accordance with Army Service Cost Position (SCP) policy.

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	2	2	2
Procurement	510	523	548
Total	512	525	550

This submission includes six additional aircraft in FY 2013, ten additional aircraft in FY 2014, and two additional aircraft in FY 2015.

Cost and Funding

Funding Summary

Appropriation and Quantity Summary
FY2015 President's Budget / December 2013 SAR (TY$ M)

Appropriation	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
RDT&E	171.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	171.6
Procurement	10819.8	1240.4	960.0	1115.8	710.7	0.0	0.0	0.0	14846.7
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 2015 Total	10991.4	1240.4	960.0	1115.8	710.7	0.0	0.0	0.0	15018.3
PB 2014 Total	10773.8	868.6	879.5	1154.4	710.7	0.0	0.0	0.0	14387.0
Delta	217.6	371.8	80.5	-38.6	0.0	0.0	0.0	0.0	631.3

Quantity	Undistributed	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	412	38	32	39	27	0	0	0	548
PB 2015 Total	2	412	38	32	39	27	0	0	0	550
PB 2014 Total	2	406	28	30	39	27	0	0	0	532
Delta	0	6	10	2	0	0	0	0	0	18

Cost and Funding

Annual Funding By Appropriation

Annual Funding TY$
2040 | RDT&E | Research, Development, Test, and Evaluation, Army

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
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 BY$
2040 | RDT&E | Research, Development, Test, and Evaluation, Army

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2005 $M	Non End Item Recurring Flyaway BY 2005 $M	Non Recurring Flyaway BY 2005 $M	Total Flyaway BY 2005 $M	Total Support BY 2005 $M	Total Program BY 2005 $M
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 TY$
2031 | Procurement | Aircraft Procurement, Army

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
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	38	1142.8	--	--	1142.8	97.6	1240.4
2015	32	896.7	--	--	896.7	63.3	960.0
2016	39	1079.5	--	--	1079.5	36.3	1115.8
2017	27	670.9	--	--	670.9	39.8	710.7
Subtotal	**548**	**13632.6**	**--**	**332.4**	**13965.0**	**881.7**	**14846.7**

Annual Funding BY$
2031 | Procurement | Aircraft Procurement, Army

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2005 $M	Non End Item Recurring Flyaway BY 2005 $M	Non Recurring Flyaway BY 2005 $M	Total Flyaway BY 2005 $M	Total Support BY 2005 $M	Total Program BY 2005 $M
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	748.1	--	--	748.1	66.8	814.9
2011	49	1033.4	--	--	1033.4	98.0	1131.4
2012	48	1145.1	--	--	1145.1	16.9	1162.0
2013	44	914.7	--	--	914.7	81.9	996.6
2014	38	928.4	--	--	928.4	79.3	1007.7
2015	32	714.6	--	--	714.6	50.5	765.1
2016	39	843.5	--	--	843.5	28.4	871.9
2017	27	514.0	--	--	514.0	30.4	544.4
Subtotal	**548**	**11791.5**	**--**	**339.2**	**12130.7**	**768.3**	**12899.0**

This submission includes six Overseas Contingency Operations (OCO) aircraft in FY 2013 for $231.3M that were not reported in the previous SAR since the funds were not received until June 2013. It also includes ten OCO aircraft in FY 2014 for $386.0M which funds were received in March 2014.

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	1076.6
2010	39	746.6
2011	49	1016.7
2012	48	1090.6
2013	44	943.9
2014	38	905.5
2015	32	705.3
2016	39	861.7
2017	27	612.2
Subtotal	**548**	**11791.5**

Low Rate Initial Production

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

Milestone II and LRIP Acquisition Decision Memorandums (ADM) 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-47Gs.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost $M	Memo
United Arab Emirates	6/28/2011	16	598.7	
Turkey	7/9/2010	6	252.0	
Australia	3/19/2010	7	249.0	

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

The CH-47F aircraft capabilities and operational successes in Operation Iraqi Freedom and Operation Enduring Freedom are generating 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 will 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. FMS will help ensure a robust supply chain and industrial base.

Nuclear Costs

None

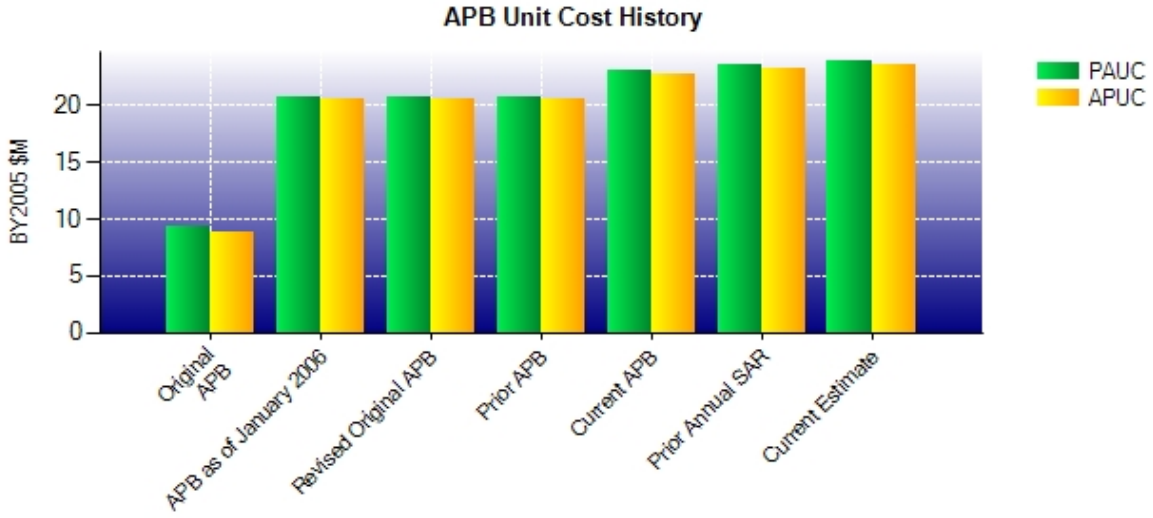
Unit Cost

Unit Cost Report

Unit Cost	BY2005 $M Current UCR Baseline (APR 2010 APB)	BY2005 $M Current Estimate (DEC 2013 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	12052.3	13082.3	
Quantity	525	550	
Unit Cost	22.957	23.786	+3.61
Average Procurement Unit Cost (APUC)			
Cost	11869.0	12899.0	
Quantity	523	548	
Unit Cost	22.694	23.538	+3.72

Unit Cost	BY2005 $M Revised Original UCR Baseline (NOV 2004 APB)	BY2005 $M Current Estimate (DEC 2013 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	10614.8	13082.3	
Quantity	512	550	
Unit Cost	20.732	23.786	+14.73
Average Procurement Unit Cost (APUC)			
Cost	10435.1	12899.0	
Quantity	510	548	
Unit Cost	20.461	23.538	+15.04

Unit Cost History



		BY2005 $M		TY $M	
	Date	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 2012	23.526	23.268	27.043	26.822
Current Estimate	DEC 2013	23.786	23.538	27.306	27.093

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY $M)

Initial PAUC Dev Est	Changes								PAUC Prod Est
	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 Prod Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
23.725	-0.037	0.271	-0.722	0.421	3.285	0.000	0.363	3.581	27.306

Initial SAR Baseline to Current SAR Baseline (TY $M)

Initial APUC Dev Est	Changes								APUC Prod Est
	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 Prod Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
23.483	-0.036	0.288	-0.724	0.422	3.296	0.000	0.364	3.610	27.093

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	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	15018.3
Total Quantity	N/A	302	512	550
Prog. Acq. Unit Cost (PAUC)	N/A	10.316	23.725	27.306

Cost Variance

Summary Then Year $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Prod Est)	171.0	11976.4	--	12147.4
Previous Changes				
Economic	-0.9	+42.0	--	+41.1
Quantity	--	+502.9	--	+502.9
Schedule	--	-345.1	--	-345.1
Engineering	+0.5	+217.5	--	+218.0
Estimating	+1.0	+1655.1	--	+1656.1
Other	--	--	--	--
Support	--	+166.6	--	+166.6
Subtotal	+0.6	+2239.0	--	+2239.6
Current Changes				
Economic	--	-61.7	--	-61.7
Quantity	--	+547.3	--	+547.3
Schedule	--	-51.9	--	-51.9
Engineering	--	+13.6	--	+13.6
Estimating	--	+150.9	--	+150.9
Other	--	--	--	--
Support	--	+33.1	--	+33.1
Subtotal	--	+631.3	--	+631.3
Total Changes	+0.6	+2870.3	--	+2870.9
CE - Cost Variance	171.6	14846.7	--	15018.3
CE - Cost & Funding	171.6	14846.7	--	15018.3

Summary Base Year 2005 $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Prod Est)	179.7	10435.1	--	10614.8
Previous Changes				
Economic	--	--	--	--
Quantity	--	+417.0	--	+417.0
Schedule	--	-42.0	--	-42.0
Engineering	+0.5	+176.9	--	+177.4
Estimating	+3.1	+1198.2	--	+1201.3
Other	--	--	--	--
Support	--	+147.1	--	+147.1
Subtotal	+3.6	+1897.2	--	+1900.8
Current Changes				
Economic	--	--	--	--
Quantity	--	+427.2	--	+427.2
Schedule	--	-16.5	--	-16.5
Engineering	--	+10.4	--	+10.4
Estimating	--	+118.6	--	+118.6
Other	--	--	--	--
Support	--	+27.0	--	+27.0
Subtotal	--	+566.7	--	+566.7
Total Changes	+3.6	+2463.9	--	+2467.5
CE - Cost Variance	183.3	12899.0	--	13082.3
CE - Cost & Funding	183.3	12899.0	--	13082.3

Previous Estimate: December 2012

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	-61.7
Adjustment for current and prior escalation. (Estimating)	+27.4	+32.6
Total Quantity variance resulting from an increase of 18 CH-47Fs from 530 to 548. (Subtotal)	+383.6	+500.7
Quantity variance resulting from an increase of 18 CH-47F's from 530 to 548. (Quantity)	(+310.4)	(+405.2)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(-16.5)	(-21.5)
Allocation to Engineering resulting from Quantity change. (Engineering) (QR)	(+10.4)	(+13.6)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(+79.3)	(+103.4)
Additional quantity variance to procure 18 option aircraft. (Quantity)	+116.8	+142.1
Acceleration of six aircraft from FY 2017 to FY 2013; ten aircraft from FY 2017 to FY 2014; and two aircraft from FY 2017 to FY 2015. (Schedule)	0.0	-30.4
Increase in New Equipment Training due to additional classes in FY 2015. (Estimating)	+11.9	+14.9
Adjustment for current and prior escalation. (Support)	+1.9	+2.4
Increase in Other Support due to additional aircraft. (QR) (Support)	+22.2	+27.3
Increase in Initial Spares due to additional aircraft. (QR) (Support)	+2.9	+3.4
Procurement Subtotal	+566.7	+631.3

(QR) Quantity Related

Contracts

Appropriation: Procurement

Contract Name	**Multiyear I**
Contractor	Boeing Helicopter
Contractor Location	Philadelphia, PA 19142
Contract Number, Type	W58RGZ-04-C-0098/1, FFP
Award Date	August 26, 2008
Definitization Date	August 26, 2008

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price at Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
722.7	N/A	35	4387.3	N/A	215	4387.3	4387.3

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to increase in aircraft on contract.

Cost and Schedule Variance Explanations

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

Contract Comments

This contract is more than 90% complete; therefore, this is the final report for this contract.

Appropriation: Procurement

Contract Name	**Multiyear II**
Contractor	Boeing Helicopter
Contractor Location	Philadelphia, PA 19142
Contract Number, Type	W58RGZ-13-C-0002, FFP
Award Date	June 10, 2013
Definitization Date	June 10, 2013

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	1531.5	N/A	65	1531.5	1531.5

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to increase in aircraft on contract.

Cost and Schedule Variance Explanations

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

Contract Comments

This is the first time this contract is being reported.

Deliveries and Expenditures

Delivered to Date	Plan to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	2	100.00%
Production	325	332	548	60.58%
Total Program Quantity Delivered	327	334	550	60.73%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	15018.3	Years Appropriated	20
Expended to Date	9193.3	Percent Years Appropriated	86.96%
Percent Expended	61.21%	Appropriated to Date	12231.8
Total Funding Years	23	Percent Appropriated	81.45%

The above data is current as of 2/27/2014.

Operating and Support Cost

CH-47F

Assumptions and Ground Rules

Cost Estimate Reference:

The O&S costs for the CH-47F are taken from the February 2014 Project Office Estimate (POE) which is based on methodology from the 2004 CH-47F Army Cost Position. It assumes an end state of 440 CH-47F operational aircraft when fully fielded flying 180 each peacetime hours per year. The total O&S cost is based on a 20-year useful life. While the common production costs of 66 MH-47Gs are included in the procurement costs, they are excluded from the O&S cost as they are managed by Special Operating Agency. The 24 peacetime attrition CH-47F aircraft procured incur no O&S costs.

Sustainment Strategy:

The sustainment approach for the CH-47F is a blend of Government and Contractor Logistics Support in conjunction with the Supportability Strategy. There is a continued focus on reducing maintenance burden and O&S costs including the use of Performance Based Logistics when appropriate.

The O&S costs assume a steady state of 440 CH-47F operational aircraft when fully fielded flying 180 each peacetime hours per year. Due to wartime losses, an additional 18 aircraft are budgeted to maintain this end strength. The total O&S timespan is 35-years. The first fielding was in FY 2004 and the last aircraft leaves service in FY 2038.

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 the Operating and Support Management Information System (OSMIS).

Unitized O&S Costs BY2005 $K		
Cost Element	**CH-47F Average Annual Per Aircraft**	**CH-47D (Antecedent) Average Annual Per Aircraft**
Unit-Level Manpower	409.484	658.828
Unit Operations	70.549	76.408
Maintenance	1208.102	1208.797
Sustaining Support	17.849	470.291
Continuing System Improvements	133.182	11.359
Indirect Support	101.244	652.265
Other	0.000	0.000
Total	1940.410	3077.948

Unitized Cost Comments:

Both the CH-47F and CH-47D estimates utilize the latest DoD inflation indices in Automated Cost Estimating Integrated Tools.

The CH-47D and CH-47F costs are based on CH-47D actuals extracted from 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.

Total cost = Average annual cost per aircraft x quantity x service life = $1940.410K x 440 x 20 = $17075.6M.

	Total O&S Cost $M			
	Current Production APB Objective/Threshold		Current Estimate	
	CH-47F		CH-47F	CH-47D (Antecedent)
Base Year	16379.4	18017.3	17075.6	18837.0
Then Year	22285.6	N/A	24277.1	19437.0

Total O&S Costs Comments:

Variance Explanations:

O&S Cost Variance		
Category	**Base Year 2005 $M**	**Change Explanation**
Prior SAR Total O&S Estimate- December 2012	16,942.64	
Cost Estimating Methodology	0	
Cost Data Update	0	
Labor Rate	0	
Energy Rate	0	
Technical Input	0	
Programmatic/Planning Factors	+132.962	Increase in Aircraft Quantity
Other	0	
Total Changes	132.962	
Current Estimate	17,075.602	

Disposal Costs:

Life-cycle demilitarization/disposal costs for the CH-47F are $6.502M (BY 2005) and are not included in the above estimate.