Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-390

CH-53K Heavy Lift Replacement Helicopter (CH-53K)

As of FY 2017 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

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-53K Heavy Lift Replacement Helicopter (CH-53K)

DoD Component

Navy

Responsible Office

Col Henry Vanderborght
PMA-261 Heavy Lift Helicopters
Program Executive Office - Air, Anti-Submarine Warfare, Assault & Special Mission Programs
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Date Assigned: May 29, 2014

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References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 22, 2005

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 24, 2013

Mission and Description

The CH-53K Heavy Lift Replacement Helicopter (CH-53K) program mission is to generate and support a robust United States Marine Corps heavy-lift capability. The primary mission is vertical heavy lift**.** The Program includes improvements in lift and range capabilities, commonality, reliability, maintainability, interoperability, ship integration, survivability, and force protection. The CH-53K helicopter will be a replacement for the CH-53E.

Executive Summary

The CH-53K Program has breached the APB for Milestone C. A Program Deviation Report was submitted to the MDA and accepted in August 2015. As a result of the breach, an Exception SAR was completed in September 2015.

First Flight was executed on Engineering Development Model (EDM) October 27, 2015 which commenced the CH-53K Systems Development and Demonstration Test Program. Currently two of the four required test EDMs are in a test flight status.

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

Threshold Breaches

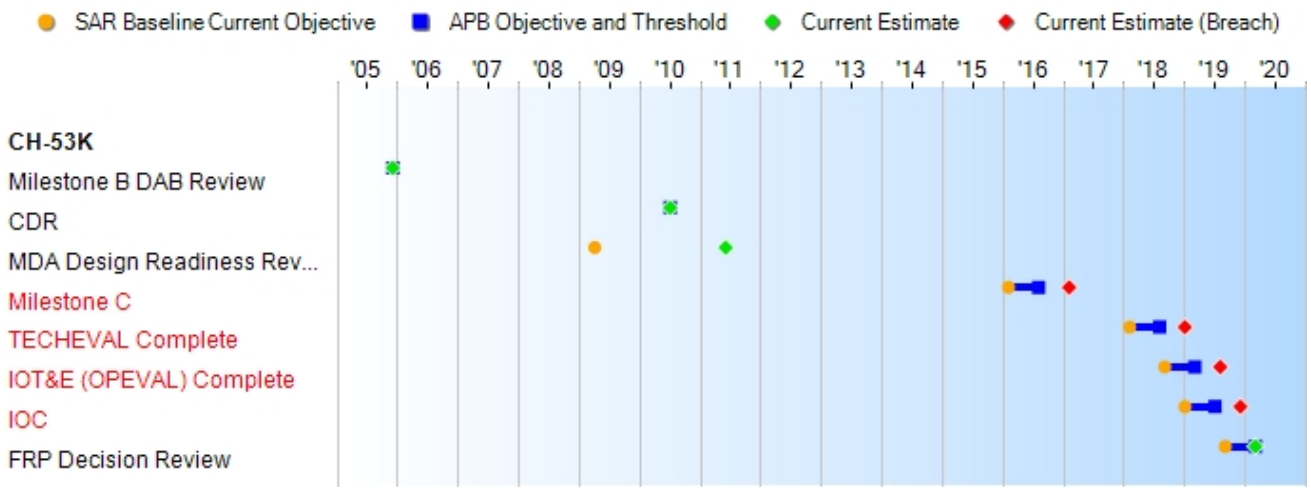
APB Breaches		
Schedule		☑
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

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

Explanation of Breach

The program has breached the APB for Milestone C as a result of discoveries during test on the Ground Test Vehicle and qualification testing. The discoveries have driven component re-designs, re-qualifications, and re-test, thereby delaying First Flight and subsequent milestones. The Program Deviation Report was accepted by the MDA in August 2015.

Schedule



Schedule Events					
Events	**SAR Baseline Development Estimate**	**Current APB Development Objective/Threshold**		**Current Estimate**	
Milestone B DAB Review	Oct 2005	Dec 2005	Dec 2005	Dec 2005	
CDR	Mar 2009	Jul 2010	Jul 2010	Jul 2010	
MDA Design Readiness Review	Apr 2009	N/A	N/A	Jun 2011	
Milestone C	Dec 2012	Feb 2016	Aug 2016	**Feb 2017**[1]	
TECHEVAL Complete	Oct 2014	Feb 2018	Aug 2018	**Jan 2019**[1]	(Ch-1)
IOT&E (OPEVAL) Complete	Jun 2015	Sep 2018	Mar 2019	**Aug 2019**[1]	(Ch-1)
IOC	Sep 2015	Jan 2019	Jul 2019	**Dec 2019**[1]	(Ch-1)
FRP Decision Review	Dec 2015	Sep 2019	Mar 2020	Mar 2020	

[1] *APB Breach*

Change Explanations

(Ch-1) The following milestones dates for TECHEVAL Complete, IOT&E (OPEVAL) Complete and IOC have changed from August 2018, March 2019, July 2019 to January 2019, August 2019 and December 2019 respectively. This is a result of discoveries during test on the Ground Test Vehicle and qualification testing. The discoveries have driven component re-designs, re-qualifications, and re-test, thereby delaying First Flight and subsequent milestones. The Program is awaiting direction from the MDA for an APB rebaseline.

Acronyms and Abbreviations

CDR - Critical Design Review
IOT&E - Initial Operational Test and Evaluation. Used interchangeably with Operational Evaluation (OPEVAL).
OPEVAL - Operational Evaluation. Used interchangeably with Initial Operational Test and Evaluation (IOT&E).
PDR - Program Deviation Report
SDD - Systems Design and Demonstration
TECHEVAL - Technical Evaluation

Performance

Performance Characteristics				
SAR Baseline Development Estimate	**Current APB Development Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Net Ready (NR)				
Satisfy 100% of NR reqts in Joint Integrated Architecture (JIA)	Satisfy 100% of NR reqts in JIA	Satisfy 100% of NR reqts designated as enterprise-level or critical in JIA	TBD	Satisfy 100% of NR reqts in JIA
Range and Payload (nm)				
110 w/30,000 lbs external load, no refuel	110 w/30,000 lbs external load, no refuel	110 w/27,000 lbs external load, no refuel	TBD	110 w/27,000 lbs external load, no refuel
Mission Reliability (MR)				
90%	90%	89%	TBD	89%
Logistics Footprint				
10% reduction from current CH-53E	10% reduction from current CH-53E	<= current CH-53E	TBD	<= current CH-53E
Sortie Generation Rate (SGR)/Average Sortie Duration (ASD)				
2.6 sorties/ 2.25 hrs	2.6 sorties/ 2.25 hrs	2.6 sorties/ 2.25 hrs	TBD	2.6 sorties/ 2.25 hrs

Classified Performance information is provided in the classified annex to this submission.

Requirements Reference

Operational Requirements Document (ORD) Change 4 dated July 15, 2010

Change Explanations

None

Notes

Net Ready KPP: JVMF, Link-16, and Mode 5 capabilities were approved for deferral by JROCM 142-10 of September 10, 2010 until IOC + 6 months for Mode 5 and IOC + 2 years for JVMF and Link-16.

Acronyms and Abbreviations

<= - Less Than or Equal To
hrs - Hours
JROCM - Joint Requirements Oversight Council Memorandum
JVMF - Joint Variable Message Format
lbs - Pounds
nm - Nautical Miles
reqts - Requirements

Track to Budget

RDT&E

Appn	BA	PE
Navy 1319	05	0605212N

Project	Name
3059	CH-53K Development

Procurement

Appn	BA	PE
Navy 1506	01	0206122M

Line Item	Name
0158	CH-53K (Heavy Lift)

Appn	BA	PE
Navy 1506	06	0206122M

Line Item	Name
0605	Spares and Repair Parts

MILCON

Appn	BA	PE
Navy 1205	01	0202176M

Project	Name
VARIOUS	VARIOUS

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2006 $M			BY 2006 $M	TY $M		
	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Development Estimate	Current APB Development Objective	Current Estimate
RDT&E	3962.0	5535.9	6089.5	5786.6	4366.4	6273.7	6598.3
Procurement	11018.9	16118.3	17730.0	16077.6	14399.9	22178.8	22563.4
Flyaway	--	--	--	13819.4	--	--	19441.6
Recurring	--	--	--	13394.0	--	--	18851.3
Non Recurring	--	--	--	425.4	--	--	590.3
Support	--	--	--	2258.2	--	--	3121.8
Other Support	--	--	--	1751.9	--	--	2423.9
Initial Spares	--	--	--	506.3	--	--	697.9
MILCON	0.0	39.6	43.6	35.1	0.0	48.1	44.4
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	14980.9	21693.8	N/A	21899.3	18766.3	28500.6	29206.1

Confidence Level

Confidence Level of cost estimate for current APB: 50%

The cost estimate recommendation aims to provide sufficient resources to execute the program under normal conditions, encountering average levels of technical, schedule, and programmatic risk and external interference. It is consistent with average resource expenditures on historical efforts of similar size, scope, and complexity.

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	4	4	6
Procurement	152	196	194
Total	156	200	200

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	4818.6	592.3	404.8	233.9	175.7	184.6	188.4	0.0	6598.3
Procurement	0.0	41.3	488.0	754.0	1222.1	1751.5	1807.4	16499.1	22563.4
MILCON	13.2	3.3	0.0	0.0	27.9	0.0	0.0	0.0	44.4
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2017 Total	4831.8	636.9	892.8	987.9	1425.7	1936.1	1995.8	16499.1	29206.1
PB 2016 Total	4853.3	673.4	947.5	937.7	1407.6	1902.7	1949.3	16432.4	29103.9
Delta	-21.5	-36.5	-54.7	50.2	18.1	33.4	46.5	66.7	102.2

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	6	0	0	0	0	0	0	0	0	6
Production	0	0	0	2	4	7	13	14	154	194
PB 2017 Total	6	0	0	2	4	7	13	14	154	200
PB 2016 Total	6	0	0	2	4	7	13	14	154	200
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	2.0
2003	--	--	--	--	--	--	2.7
2004	--	--	--	--	--	--	4.7
2005	--	--	--	--	--	--	99.3
2006	--	--	--	--	--	--	252.0
2007	--	--	--	--	--	--	338.1
2008	--	--	--	--	--	--	386.3
2009	--	--	--	--	--	--	543.9
2010	--	--	--	--	--	--	503.9
2011	--	--	--	--	--	--	558.1
2012	--	--	--	--	--	--	606.3
2013	--	--	--	--	--	--	535.6
2014	--	--	--	--	--	--	447.5
2015	--	--	--	--	--	--	538.2
2016	--	--	--	--	--	--	592.3
2017	--	--	--	--	--	--	404.8
2018	--	--	--	--	--	--	233.9
2019	--	--	--	--	--	--	175.7
2020	--	--	--	--	--	--	184.6
2021	--	--	--	--	--	--	188.4
Subtotal	6	--	--	--	--	--	6598.3

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2006 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	2.2
2003	--	--	--	--	--	--	2.9
2004	--	--	--	--	--	--	4.9
2005	--	--	--	--	--	--	100.5
2006	--	--	--	--	--	--	247.4
2007	--	--	--	--	--	--	323.9
2008	--	--	--	--	--	--	363.5
2009	--	--	--	--	--	--	505.3
2010	--	--	--	--	--	--	461.2
2011	--	--	--	--	--	--	498.9
2012	--	--	--	--	--	--	533.2
2013	--	--	--	--	--	--	466.1
2014	--	--	--	--	--	--	384.0
2015	--	--	--	--	--	--	456.0
2016	--	--	--	--	--	--	493.8
2017	--	--	--	--	--	--	331.4
2018	--	--	--	--	--	--	187.9
2019	--	--	--	--	--	--	138.4
2020	--	--	--	--	--	--	142.5
2021	--	--	--	--	--	--	142.6
Subtotal	6	--	--	--	--	--	5786.6

Annual Funding 1506 | Procurement | Aircraft Procurement, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	41.3	--	--	41.3	--	41.3
2017	2	299.1	--	1.7	300.8	187.2	488.0
2018	4	528.5	--	12.8	541.3	212.7	754.0
2019	7	891.2	--	73.2	964.4	257.7	1222.1
2020	13	1324.5	--	75.6	1400.1	351.4	1751.5
2021	14	1452.0	--	101.3	1553.3	254.1	1807.4
2022	21	2078.9	--	87.9	2166.8	264.1	2430.9
2023	24	2226.1	--	20.8	2246.9	298.6	2545.5
2024	24	2242.5	--	20.5	2263.0	281.4	2544.4
2025	24	2270.2	--	20.4	2290.6	263.5	2554.1
2026	24	2315.6	--	49.6	2365.2	252.0	2617.2
2027	24	2120.2	--	50.3	2170.5	218.0	2388.5
2028	13	1061.2	--	76.2	1137.4	154.8	1292.2
2029	--	--	--	--	--	63.8	63.8
2030	--	--	--	--	--	62.5	62.5
Subtotal	194	18851.3	--	590.3	19441.6	3121.8	22563.4

Annual Funding 1506 | Procurement | Aircraft Procurement, Navy							
Fiscal Year	Quantity	BY 2006 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	34.0	--	--	34.0	--	34.0
2017	2	241.5	--	1.4	242.9	151.1	394.0
2018	4	418.4	--	10.1	428.5	168.5	597.0
2019	7	691.8	--	56.8	748.6	200.0	948.6
2020	13	1007.9	--	57.5	1065.4	267.5	1332.9
2021	14	1083.3	--	75.6	1158.9	189.6	1348.5
2022	21	1520.6	--	64.3	1584.9	193.2	1778.1
2023	24	1596.4	--	14.9	1611.3	214.1	1825.4
2024	24	1576.6	--	14.4	1591.0	197.8	1788.8
2025	24	1564.8	--	14.1	1578.9	181.5	1760.4
2026	24	1564.8	--	33.5	1598.3	170.3	1768.6
2027	24	1404.6	--	33.3	1437.9	144.5	1582.4
2028	13	689.3	--	49.5	738.8	100.5	839.3
2029	--	--	--	--	--	40.6	40.6
2030	--	--	--	--	--	39.0	39.0
Subtotal	194	13394.0	--	425.4	13819.4	2258.2	16077.6

Cost Quantity Information 1506 | Procurement | Aircraft Procurement, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2006 $M**
2016	--	--
2017	2	204.1
2018	4	373.7
2019	7	596.6
2020	13	994.5
2021	14	1026.7
2022	21	1447.9
2023	24	1597.7
2024	24	1577.0
2025	24	1563.7
2026	24	1563.4
2027	24	1564.9
2028	13	883.8
2029	--	--
2030	--	--
Subtotal	194	13394.0

Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**TY $M**
	Total Program
2014	13.2
2015	--
2016	3.3
2017	--
2018	--
2019	27.9
Subtotal	44.4

Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**BY 2006 $M**
	Total Program
2014	11.1
2015	--
2016	2.7
2017	--
2018	--
2019	21.3
Subtotal	35.1

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	11/22/2005	2/5/2014
Approved Quantity	29	29
Reference	Milestone B Acquisition Strategy (AS)	Milestone B AS Revision 2
Start Year	2012	2017
End Year	2015	2020

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the need to plan for an efficient production ramp-up.

The current total LRIP-approved quantity value has been updated to reflect the initial LRIP decision approved quantity of 29 which has not changed since 2006. The CH-53K currently has 26 LRIP aircraft within the FY 2017 PB. LRIP is expected to begin in 2017.

Foreign Military Sales

None

Nuclear Costs

None

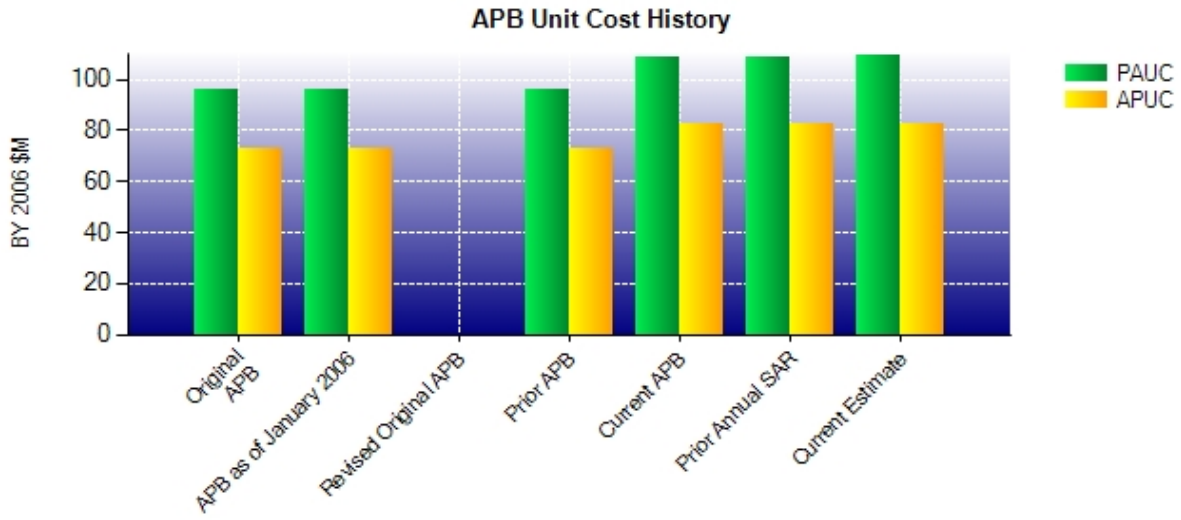
Unit Cost

Unit Cost Report

Item	BY 2006 $M Current UCR Baseline (Apr 2013 APB)	BY 2006 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	21693.8	21899.3	
Quantity	200	200	
Unit Cost	108.469	109.496	+0.95
Average Procurement Unit Cost			
Cost	16118.3	16077.6	
Quantity	196	194	
Unit Cost	82.236	82.874	+0.78

Item	BY 2006 $M Original UCR Baseline (Dec 2005 APB)	BY 2006 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	14980.9	21899.3	
Quantity	156	200	
Unit Cost	96.031	109.496	+14.02
Average Procurement Unit Cost			
Cost	11018.9	16077.6	
Quantity	152	194	
Unit Cost	72.493	82.874	+14.32

Unit Cost History



Item	Date	BY 2006 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Dec 2005	96.031	72.493	120.297	94.736
APB as of January 2006	Dec 2005	96.031	72.493	120.297	94.736
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Dec 2005	96.031	72.493	120.297	94.736
Current APB	Apr 2013	108.469	82.236	142.503	113.157
Prior Annual SAR	Dec 2014	108.398	82.311	145.520	116.483
Current Estimate	Dec 2015	109.496	82.874	146.030	116.306

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY $M)									
Initial PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
120.297	-2.004	-10.579	16.312	0.140	20.460	0.000	1.404	25.733	146.030

Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
94.736	-1.903	-5.411	12.062	0.000	15.710	0.000	1.112	21.570	116.306

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	Oct 2005	N/A	Dec 2005
Milestone C	N/A	Dec 2012	N/A	Feb 2017
IOC	N/A	Sep 2015	N/A	Dec 2019
Total Cost (TY $M)	N/A	18766.3	N/A	29206.1
Total Quantity	N/A	156	N/A	200
PAUC	N/A	120.297	N/A	146.030

Cost Variance

Summary TY $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	4366.4	14399.9	--	18766.3
Previous Changes				
Economic	-14.8	-178.2	-0.5	-193.5
Quantity	+248.0	+2929.1	--	+3177.1
Schedule	+806.0	+2340.0	--	+3146.0
Engineering	--	--	+28.1	+28.1
Estimating	+1017.5	+2905.2	-9.4	+3913.3
Other	--	--	--	--
Support	+64.9	+201.7	--	+266.6
Subtotal	+2121.6	+8197.8	+18.2	+10337.6
Current Changes				
Economic	-16.2	-190.9	-0.1	-207.2
Quantity	--	--	--	--
Schedule	+116.5	--	--	+116.5
Engineering	--	--	--	--
Estimating	+10.0	+142.5	+26.3	+178.8
Other	--	--	--	--
Support	--	+14.1	--	+14.1
Subtotal	+110.3	-34.3	+26.2	+102.2
Total Changes	+2231.9	+8163.5	+44.4	+10439.8
CE - Cost Variance	6598.3	22563.4	44.4	29206.1
CE - Cost & Funding	6598.3	22563.4	44.4	29206.1

Summary BY 2006 $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	3962.0	11018.9	--	14980.9
Previous Changes				
Economic	--	--	--	--
Quantity	+201.7	+2209.9	--	+2411.6
Schedule	+603.9	+591.9	--	+1195.8
Engineering	--	--	+21.5	+21.5
Estimating	+875.3	+2165.6	-6.7	+3034.2
Other	--	--	--	--
Support	+53.6	-17.9	--	+35.7
Subtotal	+1734.5	+4949.5	+14.8	+6698.8
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	+81.7	--	--	+81.7
Engineering	--	--	--	--
Estimating	+8.4	+100.9	+20.3	+129.6
Other	--	--	--	--
Support	--	+8.3	--	+8.3
Subtotal	+90.1	+109.2	+20.3	+219.6
Total Changes	+1824.6	+5058.7	+35.1	+6918.4
CE - Cost Variance	5786.6	16077.6	35.1	21899.3
CE - Cost & Funding	5786.6	16077.6	35.1	21899.3

Previous Estimate: September 2015

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-16.2
Adjustment for current and prior escalation. (Estimating)	+8.4	+10.0
Stretch-out of development effort between FY 2015 and FY 2020 due to Contractor schedule delays. (Schedule)	+81.7	+116.5
RDT&E Subtotal	+90.1	+110.3

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-190.9
Adjustment for current and prior escalation. (Estimating)	+0.3	+0.4
Revised estimate to reflect the application of new outyear inflation indices. (Estimating)	+100.6	+142.1
Increase in Other Support due to refined cost estimate. (Support)	+1.8	+11.1
Increase in Initial Spares due to funding realignment beginning in FY 2017. (Support)	+6.5	+3.0
Procurement Subtotal	+109.2	-34.3

MILCON	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.1
Increase due to refined cost estimate. (Estimating)	+20.2	+26.2
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
MILCON Subtotal	+20.3	+26.2

Contracts

Contract Identification

Appropriation: RDT&E

Contract Name: System Development and Demonstration

Contractor: Sikorsky Aircraft Corporation

Contractor Location: 6900 Main Street
Stratford, CT 06615-9129

Contract Number: N00019-06-C-0081

Contract Type: Cost Plus Incentive Fee (CPIF)

Award Date: January 03, 2006

Definitization Date: January 03, 2006

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
3052.2	N/A	5	3012.3	N/A	5	4002.7	4185.9

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to a reduction in target fee associated with contract type conversion from Cost Plus Award Fee to Cost Plus Incentive Fee and scope adjustments. Program Manager's Estimated Price is equal to the current Estimate at Completion plus scope changes, profit and fee.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	-189.3	-117.6
Previous Cumulative Variances	-175.6	-122.0
Net Change	-13.7	+4.4

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Test & Evaluation for Gearbox Engineering Support for Engineering Design Model (EDM) 1 First Flight and for Ground Test Vehicle (GTV) Op-tempo delays, as well as preparations in support of EDM3 First Flight; to include, final special inspection and aircraft ground run activities and support for test conduct. Support of GTV activities during remaining envelope expansion/Preliminary Flight Acceptance Testing and Dynamics added to the unfavorable net cost variance due to overruns on the Main Rotor Blades for EDM2 and EDM4.

The favorable net change in the schedule variance is due to the receipt of late parts within the Supportability IPT, as well as final acceptance of supplier data in support of maintenance plan development, receipt of materials to build up dynamic component spares and receipt of materials to fabricate the maintenance training device main rotor head.

Notes

The definitization date above reflects the definitization of the Interim System Development and Demonstration (iSDD) contract for $7.63M. On April 5, 2006 the System Development and Demonstration (SDD) contract was signed for the negotiated cost of $2.73B.

Initial Contract Price Quantity was updated to correct previous submissions. The iSDD contract had a quantity of 0. This quantity was later negotiated to 5 when the full SDD contract was initialized.

Initial quantity has been updated to reflect the number of aircraft procured.

Contract Identification

Appropriation: RDT&E

Contract Name: System Demonstration Test Articles

Contractor: Sikorsky Aircraft Corporation

Contractor Location: 6900 Main Street
Stratford, CT 06614

Contract Number: N00019-06-C-0081/2

Contract Type: Cost Plus Incentive Fee (CPIF)

Award Date: May 30, 2013

Definitization Date: May 30, 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
435.3	N/A	4	477.8	N/A	4	486.9	485.6

Target Price Change Explanation

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

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	+3.4	-55.7
Previous Cumulative Variances	+3.9	-40.9
Net Change	-0.5	-14.8

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to the higher part cost of transmission shafts assemblies than originally planned by the Transmissions & Drives Integrated Product Team.

The unfavorable net change in the schedule variance is due to Final Assembly delays associated with Advanced Change Notices (ACNs) as well as late part deliveries and/or late starts of Air Vehicle and Dynamics components.

Notes

Program Manager's estimates provided for this submission reflect the November 2015 Estimate At Completion. Program Manager's estimated price is equal to the current estimate plus scope changes, profit and fee.

In addition, critical parts for System Demonstration Test Articles 5&6 were added to the contract.

Contract Identification

Appropriation: RDT&E
Contract Name: SDTA Engines
Contractor: General Electric
Contractor Location: 1000 Western Avenue
Lynn, MA 01905
Contract Number: N00013-13-C-0132/3
Contract Type: Firm Fixed Price (FFP)
Award Date: July 18, 2013
Definitization Date: July 31, 2014

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
15.7	N/A	0	114.2	N/A	22	114.2	114.2

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to exercising options to procure engines.

Cost and Schedule Variance Explanations

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

Notes

Initial contract target price of $15.7M was awarded on July 18, 2013 for critical parts, systems engineering, and program management related to engine procurement. On July 31, 2014, the Government added FFP CLINs to procure 16 engines and the associated technical data and tooling. On July 15, 2015, the Government exercised an option to procure an additional six engines. PM's estimated price is equal to the current estimate plus scope changes, profit, and fee.

An administrative change to Initial contract quantity has been changed from the previous SAR to reflect zero quantities associated with the initial award for critical parts, systems engineering, and program Management.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	6	0.00%
Production	0	0	194	0.00%
Total Program Quantity Delivered	0	0	200	0.00%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	29206.1	Years Appropriated	15
Expended to Date	4457.4	Percent Years Appropriated	51.72%
Percent Expended	15.26%	Appropriated to Date	5468.7
Total Funding Years	29	Percent Appropriated	18.72%

The above data is current as of February 09, 2016.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	January 08, 2016
Source of Estimate:	POE
Quantity to Sustain:	200
Unit of Measure:	Aircraft
Service Life per Unit:	30.00 Years
Fiscal Years in Service:	FY 2017 - FY 2059

- Aircraft Attrition Rate: 0.5% of Total Aircraft Inventory (TAI) per year.
- Aircraft Pipeline Factor: 15.5% of TAI.
- Squadrons: 10 Marine Heavy Helicopter (HMH) squadrons (8 active / 1 reserve) / 1 Marine Training (HMHT) squadron.
- Helicopters per HMH (active) squadron: 16.
- Helicopters per HMH (reserve) squadron: 16.
- Helicopters per HMHT squadron: 21.
- Monthly Flight Hours per Helicopter (TAI): 17.9.
- Aircraft reliability projections per NAVAIR-4.1.10 input.
- Total Operating Helicopter Years: 5,035.

Sustainment Strategy

The CH-53K will be sustained utilizing Organizational, Intermediate, and Depot levels of maintenance. Repair and Overhaul capability establishment will be phased in over five years and will be based on component maturity, operational readiness and affordability factors. Product Support analyses are being matured and will be compared to data obtained during flight test and initial operations to establish sustainment baselines at the component level. A Fleet Common Operating Environment (FCOE) has been established to fuse information from operations and sustainment activities across the Naval Aviation Enterprise and provide near real-time comparisons of actual environmental, reliability, cost and sustainment infrastructure performance against the established baselines. Current sustainment planning activities are facilitating engagement with both public and private industrial support services in the development of performance-based product support arrangements as well as utilizing the FCOE to enable more agile and effective product support packages during CH-53K sustainment operations.

Antecedent Information

- The antecedent system is CH-53E.
- Antecedent CH-53E data representative of FY 2012 to FY 2014 average of Naval Visibility And Management of Operating and Support Cost (VAMOSC) reported cost data.
- CH-53E is not capable of meeting Joint Requirements Oversight Council Key Performance Parameter requirements established for the CH-53K (CH-53K provides three times the lift capability compared to CH-53E).
- CH-53E Total O&S Cost (Base Year 2006$) = CH-53E Annual O&S Cost per Helicopter * CH-53K Total Operating Helicopter Years. As historical data is unavailable for all years of the Antecedent System's life cycle, the calculation is supplemented with CH-53K data.

Annual O&S Costs BY2006 $M		
Cost Element	**CH-53K Average Annual Cost Per Aircraft**	**CH-53E (Antecedent) Average Annual Cost Per Aircraft**
Unit-Level Manpower	1.215	1.324
Unit Operations	0.407	0.294
Maintenance	4.486	3.148
Sustaining Support	0.240	0.103
Continuing System Improvements	0.576	0.517
Indirect Support	0.469	0.606
Other	0.000	0.000
Total	7.393	5.992

Item	Total O&S Cost $M			
	CH-53K			CH-53E (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	37520.3	41272.3	37224.7	30173.3
Then Year	78156.7	N/A	75255.4	N/A

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

- CH-53K Average Annual Cost per Helicopter = Total O&S Cost (Base Year) / Total Operating Helicopter Years.
- $37,224.7M / 5,035 Total Operating Helicopter Years = $7.393M per Year per Helicopter.

O&S Cost Variance		
Category	**BY 2006 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Sep 2015 SAR	37221.6	
Programmatic/Planning Factors	-74.1	FY 2017 PB Flight Hours for FYDP
Cost Estimating Methodology	-901.4	Full Lifecycle engineering approach for Aviation Depot Level Repairable (AVDLR)
Cost Data Update	732.8	Updated VAMOSC data and FY 2016 inflation rates
Labor Rate	56.8	2016 Military Composite Pay Rates
Energy Rate	-82.9	Fuel pricing per guidance
Technical Input	271.9	Updated Training Device refresh
Other	0.0	
Total Changes	3.1	
Current Estimate	37224.7	

The updated estimate is <1% increase from the 2014 SAR O&S estimate, from $37,221.6 to $37,224.7 (BY2006$M). O&S Cost decrease is due to updated methodology, rates, and FY 2017 PB flight hours.

Disposal Estimate Details

Date of Estimate:	January 30, 2015
Source of Estimate:	POE
Disposal/Demilitarization Total Cost (BY 2006 $M):	Total costs for disposal of all Aircraft are 23.9

Estimate to be refined at Milestone C based on the System Disposal Plan Annex to the Life Cycle Sustainment Plan.