



# Selected Acquisition Report (SAR)

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



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

As of FY 2016 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## 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

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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 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

Development of the helicopter has continued and shows a maturing and technically sound design that is currently projected to meet all KPPs. Critical Technology Elements are maturing to plan, and sub-system ground test activities have continued. Since the last submission, the CH-53K program began shakedown light-off of the Ground Test Vehicle (GTV) which has completed over 180 test hours. The first flight vehicle, Engineering Development Model (EDM) 1, executed bare head light-off and bladed ground turns successfully. Ninety-five percent of component level testing is complete in support of first flight. Acquisition Strategy revision 2 was signed on April 18, 2014. The revision added two RDT&E funded System Demonstration Test Article (SDTA) assets to effectively demonstrate that manufacturing processes are both mature and under control to ensure production readiness. The CH-53K Roll Out Ceremony was conducted on May 5, 2014, at the Florida Assembly Flight Operations facility in West Palm Beach, FL.

There are no significant software related issues on the 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 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	Aug 2016 (Ch-1)
TECHEVAL Complete	Oct 2014	Feb 2018	Aug 2018	Jul 2018 (Ch-1)
IOT&E (OPEVAL) Complete	Jun 2015	Sep 2018	Mar 2019	Feb 2019 (Ch-1)
IOC	Sep 2015	Jan 2019	Jul 2019	Jul 2019
FRP Decision Review	Dec 2015	Sep 2019	Mar 2020	Mar 2020

### Change Explanations

(Ch-1) The current estimate for Milestone C changed from Jun 2016 to Aug 2016. The current estimate for TECHEVAL Complete changed from Feb 2018 to Jul 2018. The current estimate for IOT&E (OPEVAL) Complete changed from Sep 2018 to Feb 2019. These changes are due to test program delays primarily resulting from delayed parts qualification and receipt.

## Acronyms and Abbreviations

CDR - Critical Design Review

EDM - Engineering Development Model

GTV - Ground Test Vehicle

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).

SAC - Sikorsky Aircraft Corporation

SDTA - System Demonstration Test Article

TECHEVAL - Technical Evaluation

USMC - United States Marine Corps

## Performance

Performance Characteristics				
SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Demonstrated Performance	Current Estimate
<b>Net Ready (NR)</b>				
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
<b>Range and Payload (nm)</b>				
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
<b>Mission Reliability (MR)</b>				
90%	90%	89%	TBD	89%
<b>Logistics Footprint</b>				
10% reduction from current CH-53E	10% reduction from current CH-53E	<= current CH-53E	TBD	<= current CH-53E
<b>Sortie Generation Rate (SGR)/Average Sortie Duration (ASD)</b>				
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: JV MF, 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 JV MF and Link-16.

**Acronyms and Abbreviations**

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)

Navy 1506 06 0206122M

Line Item	Name
-----------	------

0605 Spares and Repair Parts

**MILCON**

Appn	BA	PE
------	----	----

Navy 1205 01 0202176M

Project	Name
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00318891 CH-53 Infrastructure Upgrades (Kanehoe Bay, HI)

62573676 CH-53K Maintenance Training Facility (New River, NC) (Sunk)

## 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	5696.5	4366.4	6273.7	6488.0
Procurement	11018.9	16118.3	17730.0	15968.4	14399.9	22178.8	22597.7
Flyaway	--	--	--	13718.5	--	--	19463.4
Recurring	--	--	--	13296.6	--	--	18872.9
Non Recurring	--	--	--	421.9	--	--	590.5
Support	--	--	--	2249.9	--	--	3134.3
Other Support	--	--	--	1750.1	--	--	2433.3
Initial Spares	--	--	--	499.8	--	--	701.0
MILCON	0.0	39.6	43.6	14.8	0.0	48.1	18.2
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	14980.9	21693.8	N/A	21679.7	18766.3	28500.6	29103.9

#### 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	6
Procurement		152	194
Total		156	200

## Cost and Funding

### Funding Summary

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	4280.4	559.7	632.1	475.1	176.3	178.0	186.4	0.0	6488.0
Procurement	0.0	0.0	41.3	472.4	761.4	1224.6	1716.3	18381.7	22597.7
MILCON	13.2	0.0	0.0	0.0	0.0	5.0	0.0	0.0	18.2
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2016 Total	4293.6	559.7	673.4	947.5	937.7	1407.6	1902.7	18381.7	29103.9
PB 2015 Total	4308.4	573.2	762.0	979.0	977.2	1373.0	1478.7	19012.2	29463.7
Delta	-14.8	-13.5	-88.6	-31.5	-39.5	34.6	424.0	-630.5	-359.8

Quantity Summary										
FY 2016 President's Budget / December 2014 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
Development	6	0	0	0	0	0	0	0	0	6
Production	0	0	0	0	2	4	7	13	168	194
PB 2016 Total	6	0	0	0	2	4	7	13	168	200
PB 2015 Total	6	0	0	0	2	4	7	7	174	200
Delta	0	0	0	0	0	0	0	6	-6	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	--	--	--	--	--	--	558.2
2012	--	--	--	--	--	--	606.3
2013	--	--	--	--	--	--	535.5
2014	--	--	--	--	--	--	447.5
2015	--	--	--	--	--	--	559.7
2016	--	--	--	--	--	--	632.1
2017	--	--	--	--	--	--	475.1
2018	--	--	--	--	--	--	176.3
2019	--	--	--	--	--	--	178.0
2020	--	--	--	--	--	--	186.4
Subtotal	6	--	--	--	--	--	6488.0



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	--	--	--	--	--	--	498.8
2012	--	--	--	--	--	--	532.8
2013	--	--	--	--	--	--	463.5
2014	--	--	--	--	--	--	383.5
2015	--	--	--	--	--	--	472.2
2016	--	--	--	--	--	--	524.2
2017	--	--	--	--	--	--	386.7
2018	--	--	--	--	--	--	140.7
2019	--	--	--	--	--	--	139.3
2020	--	--	--	--	--	--	143.0
Subtotal	6	--	--	--	--	--	5696.5

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	299.3	--	1.7	301.0	171.4	472.4	
2018	4	528.9	--	12.8	541.7	219.7	761.4	
2019	7	892.1	--	73.2	965.3	259.3	1224.6	
2020	13	1325.9	--	75.7	1401.6	314.7	1716.3	
2021	14	1513.6	--	101.4	1615.0	334.3	1949.3	
2022	21	2022.6	--	87.9	2110.5	281.6	2392.1	
2023	24	2228.7	--	20.8	2249.5	316.4	2565.9	
2024	24	2245.1	--	20.5	2265.6	245.2	2510.8	
2025	24	2272.9	--	20.4	2293.3	261.1	2554.4	
2026	24	2318.3	--	49.6	2367.9	236.3	2604.2	
2027	24	2122.3	--	50.3	2172.6	217.6	2390.2	
2028	13	1061.9	--	76.2	1138.1	150.4	1288.5	
2029	--	--	--	--	--	63.8	63.8	
2030	--	--	--	--	--	62.5	62.5	
Subtotal	194	18872.9	--	590.5	19463.4	3134.3	22597.7	

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	--	33.7	--	--	33.7	--	33.7	
2017	2	239.6	--	1.4	241.0	137.2	378.2	
2018	4	415.2	--	10.0	425.2	172.5	597.7	
2019	7	686.6	--	56.3	742.9	199.6	942.5	
2020	13	1000.5	--	57.1	1057.6	237.5	1295.1	
2021	14	1119.7	--	75.0	1194.7	247.3	1442.0	
2022	21	1466.9	--	63.8	1530.7	204.2	1734.9	
2023	24	1584.7	--	14.8	1599.5	225.0	1824.5	
2024	24	1565.0	--	14.3	1579.3	171.0	1750.3	
2025	24	1553.4	--	13.9	1567.3	178.4	1745.7	
2026	24	1553.3	--	33.2	1586.5	158.4	1744.9	
2027	24	1394.1	--	33.0	1427.1	143.0	1570.1	
2028	13	683.9	--	49.1	733.0	96.8	829.8	
2029	--	--	--	--	--	40.3	40.3	
2030	--	--	--	--	--	38.7	38.7	
Subtotal	194	13296.6	--	421.9	13718.5	2249.9	15968.4	

Cost Quantity Information 1506   Procurement   Aircraft Procurement, Navy		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2006 \$M
2016	--	--
2017	2	202.6
2018	4	370.9
2019	7	592.1
2020	13	987.1
2021	14	1019.2
2022	21	1438.2
2023	24	1586.0
2024	24	1565.5
2025	24	1552.3
2026	24	1552.0
2027	24	1553.4
2028	13	877.3
2029	--	--
2030	--	--
<b>Subtotal</b>	<b>194</b>	<b>13296.6</b>

Annual Funding 1205   MILCON   Military Construction, Navy and Marine Corps	
Fiscal Year	TY \$M
	Total Program
2014	13.2
2015	--
2016	--
2017	--
2018	--
2019	5.0
Subtotal	18.2

Annual Funding 1205   MILCON   Military Construction, Navy and Marine Corps	
Fiscal Year	BY 2006 \$M
	Total Program
2014	11.0
2015	--
2016	--
2017	--
2018	--
2019	3.8
Subtotal	14.8

## Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
<b>Approval Date</b>	11/22/2005	2/5/2014
<b>Approved Quantity</b>	29	29
<b>Reference</b>	Milestone B Acquisition Strategy (AS)	Milestone B Acquisition Strategy (AS) Revision 2
<b>Start Year</b>	2012	2017
<b>End Year</b>	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 previous year SAR accounted for only the LRIP aircraft budgeted in the FY 2015 PB. The CH-53K currently has 26 LRIP aircraft within the FY 2016 PB. LRIP is expected to begin in 2017.

## **Foreign Military Sales**

None

## **Nuclear Costs**

None



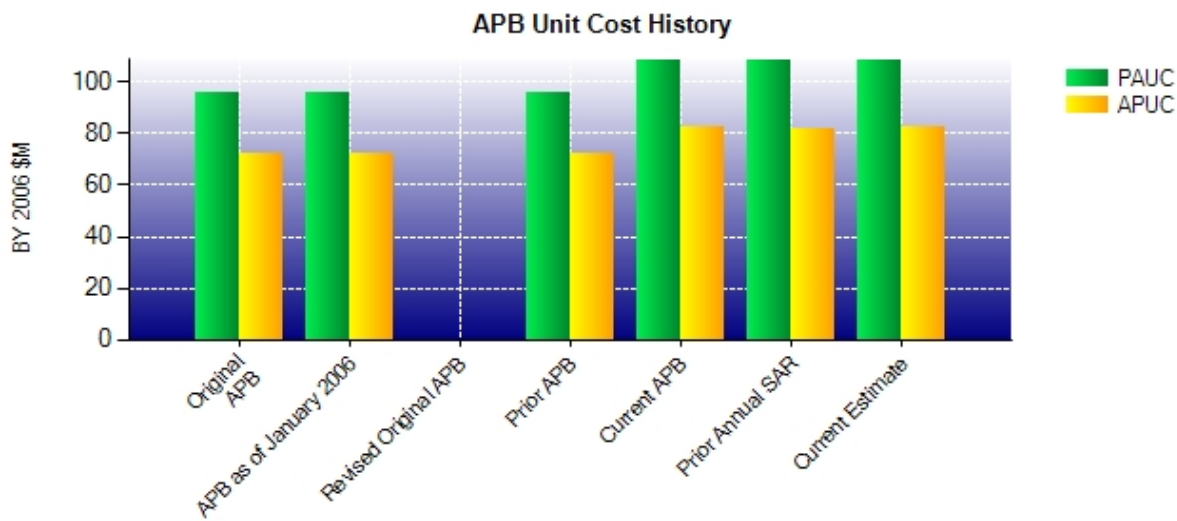
## Unit Cost

### Unit Cost Report

Item	BY 2006 \$M	BY 2006 \$M	% Change
	Current UCR Baseline (Apr 2013 APB)	Current Estimate (Dec 2014 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	21693.8	21679.7	
Quantity	200	200	
Item	108.469	108.398	-0.07
<b>Average Procurement Unit Cost</b>			
Cost	16118.3	15968.4	
Quantity	196	194	
Unit Cost	82.236	82.311	+0.09

Item	BY 2006 \$M	BY 2006 \$M	% Change
	Original UCR Baseline (Dec 2005 APB)	Current Estimate (Dec 2014 SAR)	
<b>Program Acquisition Unit Cost</b>			
Cost	14980.9	21679.7	
Quantity	156	200	
Unit Cost	96.031	108.398	+12.88
<b>Average Procurement Unit Cost</b>			
Cost	11018.9	15968.4	
Quantity	152	194	
Unit Cost	72.493	82.311	+13.54

**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 2013	108.220	81.727	147.318	117.667
Current Estimate	Dec 2014	108.398	82.311	145.520	116.483

**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	-0.968	-10.578	15.730	0.140	19.566	0.000	1.333	25.223	145.520

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	-0.919	-5.411	12.062	0.000	14.975	0.000	1.040	21.747	116.483

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	Aug 2016
IOC	N/A	Sep 2015	N/A	Jul 2019
Total Cost (TY \$M)	N/A	18766.3	N/A	29103.9
Total Quantity	N/A	156	N/A	200
PAUC	N/A	120.297	N/A	145.520

## Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Development Estimate)	4366.4	14399.9	--	18766.3
Previous Changes				
Economic	+20.9	+127.3	-0.1	+148.1
Quantity	+248.0	+2929.1	--	+3177.1
Schedule	+806.0	+2448.2	--	+3254.2
Engineering	--	--	+28.1	+28.1
Estimating	+1084.7	+2775.4	+17.4	+3877.5
Other	--	--	--	--
Support	+64.9	+147.5	--	+212.4
Subtotal	+2224.5	+8427.5	+45.4	+10697.4
Current Changes				
Economic	-35.7	-305.5	-0.4	-341.6
Quantity	--	--	--	--
Schedule	--	-108.2	--	-108.2
Engineering	--	--	--	--
Estimating	-67.2	+129.8	-26.8	+35.8
Other	--	--	--	--
Support	--	+54.2	--	+54.2
Subtotal	-102.9	-229.7	-27.2	-359.8
Total Changes	+2121.6	+8197.8	+18.2	+10337.6
CE - Cost Variance	6488.0	22597.7	18.2	29103.9
CE - Cost & Funding	6488.0	22597.7	18.2	29103.9

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	+606.0	--	+1209.9
Engineering	--	--	+21.5	+21.5
Estimating	+932.7	+2074.1	+13.6	+3020.4
Other	--	--	--	--
Support	+53.6	-53.8	--	-0.2
Subtotal	+1791.9	+4836.2	+35.1	+6663.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	-14.1	--	-14.1
Engineering	--	--	--	--
Estimating	-57.4	+91.5	-20.3	+13.8
Other	--	--	--	--
Support	--	+35.9	--	+35.9
Subtotal	-57.4	+113.3	-20.3	+35.6
Total Changes	+1734.5	+4949.5	+14.8	+6698.8
CE - Cost Variance	5696.5	15968.4	14.8	21679.7
CE - Cost & Funding	5696.5	15968.4	14.8	21679.7

Previous Estimate: December 2013

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-35.7
Adjustment for current and prior escalation. (Estimating)	+9.7	+11.5
Revised estimate due to funding constraints within the FYDP. (Estimating)	-67.1	-78.7
<b>RDT&amp;E Subtotal</b>	<b>-57.4</b>	<b>-102.9</b>

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-305.5
Acceleration of procurement buy profile resulting from moving six aircraft from FY 2028 to FY 2020. (Schedule)	0.0	-91.2
Additional Schedule variance due to moving six aircraft from FY 2028 to FY 2020. (Schedule)	-14.1	-17.0
Revised estimate to reflect the application of new outyear inflation indices. (Estimating)	+91.5	+129.8
Increase in Other Support due to refined cost estimate. (Support)	+15.5	+17.5
Increase in Initial Spares due to refined cost estimates. (Support)	+20.4	+36.7
<b>Procurement Subtotal</b>	<b>+113.3</b>	<b>-229.7</b>

MILCON	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.4
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
Revised estimate due to refined cost estimate. (Estimating)	-20.4	-26.9
<b>MILCON Subtotal</b>	<b>-20.3</b>	<b>-27.2</b>

## 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	3020.0	N/A	5	3833.7	4069.4

### 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 (1/31/2015)	-143.7	-121.9
Previous Cumulative Variances	-68.1	-127.4
Net Change	-75.6	+5.5

### Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to continued discovery of design issues during Ground Test Vehicle (GTV) and Gearbox testing, increased instrumentation material due to component qualification failures, as well as re-work and retrofit activities, resulting in additional cost growth primarily in the areas of Development Test & Evaluation, Transmissions & Drive Train Systems, and Rotors.

The favorable net change in the schedule variance is due to a baseline change that was implemented in the Integrated Master Schedule (IMS) to align IMS milestones to the top-level contract schedule. The IMS baseline changes eliminated \$26.3M of unfavorable schedule variance, reducing the total cumulative schedule variance to \$-121.9M and creating a favorable net change from the previous cumulative variance.

**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	436.6	N/A	4	444.1	459.4

**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 (1/31/2015)	+2.3	+18.6
Previous Cumulative Variances	+1.1	-2.9
Net Change	+1.2	+21.5

**Cost and Schedule Variance Explanations**

The favorable net change in the cost variance is due to Project Management efforts requiring less manpower and activity than planned.

The favorable net change in the schedule variance is due to early deliveries of Sponson materials, Main Rotor Pylon structures and fairings, Aft Transition parts, and Propulsion Nacelles. Additionally, the June 2014 contract modification relieved schedule pressure on SDTA deliveries, which amplified the favorable cumulative schedule variance.

**Notes**

Program Manager's Estimate at Completion is based on potential realization of schedule risk.

**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 31, 2014  
**Definitization Date:**

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	16	84.2	N/A	16	84.2	84.2

**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.

**Cost and Schedule Variance Explanations**

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

**Notes**

This is the first time this contract is being reported.

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 associated technical data and tooling. Estimated Price includes critical parts. PM's Estimated Price is equal to the current Estimate plus scope changes, profit and fee. Initial target price is equal to the current target price due to FFP contract type.

Initial quantity was updated to 16 to reflect that critical parts were procured for 16 engines.

## 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	29103.9	Years Appropriated	14
Expended to Date	3984.9	Percent Years Appropriated	48.28%
Percent Expended	13.69%	Appropriated to Date	4853.3
Total Funding Years	29	Percent Appropriated	16.68%

The above data is current as of January 31, 2015.

## Operating and Support Cost

### Cost Estimate Details

<b>Date of Estimate:</b>	January 30, 2015
<b>Source of Estimate:</b>	POE
<b>Quantity to Sustain:</b>	200
<b>Unit of Measure:</b>	Aircraft
<b>Service Life per Unit:</b>	30.00 Years
<b>Fiscal Years in Service:</b>	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

- Antecedent CH-53E data representative of FY 2011 to FY 2013 average of Naval Visibility And Management of Operating and Support Cost (VAMOSOC) 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.
- \$6.071M per Year per Helicopter \* 5,035 Total Operating Helicopter Years = \$30,562.4M

Annual O&S Costs BY2006 \$M			
Cost Element	CH-53K		CH-53E (Antecedent)
	Average Annual Cost Per Aircraft		Average Annual Cost Per Aircraft
Unit-Level Manpower		1.034	1.298
Unit Operations		0.394	0.301
Maintenance		4.725	3.154
Sustaining Support		0.186	0.096
Continuing System Improvements		0.586	0.618
Indirect Support		0.469	0.604
Other		0.000	0.000
<b>Total</b>		<b>7.394</b>	<b>6.071</b>

Item	Total O&S Cost \$M			
	CH-53K			CH-53E (Antecedent)
	Current Development APB Objective/Threshold	Current Estimate		
<b>Base Year</b>	37520.3	41272.3	37221.6	30562.4
<b>Then Year</b>	78156.7	N/A	71812.6	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.
- \$37,221.6M / 5,035 Total Operating Helicopter Years = \$7.394M per Year per Helicopter.

O&S Cost Variance		
Category	BY 2006 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2013 SAR	37486.6	
Programmatic/Planning Factors	-386.6	Schedule Alignment with PB-16 Procurement Profile
Cost Estimating Methodology	630.9	Updated operating aircraft calculation
Cost Data Update	54.9	Updated VAMOSOC data, inflation factors, and other cost inputs
Labor Rate	-249.4	2015 Military Composite Pay Rates
Energy Rate	-323.3	Fuel price alignment with current rates
Technical Input	8.5	Bottoms-up headcount input of program PRL/PRE requirements
Other	0.0	
<b>Total Changes</b>	<b>-265.0</b>	
Current Estimate	37221.6	

The updated estimate is < 1% decrease from the 2013 SAR O&S estimate, from \$37,486.6 to \$37,221.6 (BY2006\$M).

O&S Cost decrease due to updated rates, cost data and program schedules.

### Disposal Estimate Details

<b>Date of Estimate:</b>	January 30, 2015
<b>Source of Estimate:</b>	POE
<b>Disposal/Demilitarization Total Cost (BY 2006 \$M):</b>	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.