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

CH-53K King Stallion (CH-53K)

As of FY 2021 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)
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

Program Information

Program Name
CH-53K King Stallion (CH-53K)

DoD Component
Navy

Responsible Office

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References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 4, 2017

Approved APB

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated November 26, 2019

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

Program Highlights Since Last Report

Four Engineering Development Model (EDM) and two System Demonstration Test Article (SDTA) aircraft are in developmental flight test at Naval Air Station (NAS), Patuxent River, Maryland. A third SDTA completed the supportability test and evaluation Logistics Demonstration (LOGDEMO) event at Marine Corps Air Station (MCAS), New River, North Carolina in September 2019.

On January 4, 2019, the program submitted a Program Deviation Report (PDR) to the MDA for a breach to the APB schedule milestones. Additionally, in January, the Department of Navy submitted an Above Threshold Reprogramming (ATR) request of $158M to Congress to enable delivery of a deployable Initial Operational Capability (IOC) configuration.

On March 1, 2019, an ADM was approved for a program restructure plan and the full ATR was approved on July 17, 2019. Funding was applied to the System Development and Demonstration (SDD) Contract in August 2019 to enable the program to continue to execute engineering design work for correction of deficiencies, resolution of technical issues and continuation of developmental flight test.

An updated Acquisition Strategy was briefed and approved by the Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RDA)) on October 31, 2019. The revised APB was approved by ASN(RDA) on November 26, 2019 to update the schedule milestones and program costs in accordance with the updated Acquisition Strategy. An ADM was signed on January 6, 2020 to approve two additional LRIP lots, an increase in LRIP aircraft quantities, and a full funding commitment from the United States Marine Corps (USMC).

Resolution of remaining technical issues and completion of airworthiness certification testing remain top priorities for planned entry into Initial Operational Test & Evaluation (IOT&E). The planned design completion for the technical issues is anticipated by 3rd quarter of FY 2020. The most critical technical issue has been the Exhaust Gas Re-ingestion (EGR) and Engine Integration. The EGR design modifications were completed and a successful flight demonstration was conducted in December 2019.

The Lot 2 and Lot 3 LRIP Production Contract was awarded on May 17, 2019 for 12 aircraft (5 - FY18/7 - FY19). On July 2, 2019, an Over Target Baseline (OTB)/Over Target Schedule (OTS) was initiated for the SDD Contract (CLIN 0004 SDD only) expected to be completed in March 2020. The OTB/OTS will ensure alignment between the performance measurement baseline and program execution to provide more meaningful Earn Value Management (EVM) data for the completion of SDD.

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

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
September 2003	Analysis of Alternatives completed, resulting in decision to initiate a Heavy Lift Replacement program
December 2004	JROC approved CH-53K ORD.
October 2005	The Heavy Lift Replacement (HLR) program completed a Milestone B Defense Acquisition Board (DAB).
December 2005	USD(AT&L) signed the Milestone B ADM for entry into System Development and Demonstration (SDD).
January 2006	SDD contract awarded to Sikorsky for the CH-53K
July 2010	The CH-53K program conducted the Critical Design Review.
June 2011	The Assistant Secretary of Defense for Research and Engineering completed a Post-CDR Assessment, determining the program situated to enter Systems Capability and Manufacturing Process Demonstration.
April 2013	Updated APB approved, based on an updated Program Life Cycle Cost Estimate (PLCCE) and January 2013 SCP.
May 2013	Contract awarded for 4 System Developmental Test Article (SDTA) aircraft. Beginning with this effort, the CH-53K program began procuring GE-38 (T-408) engines directly from General Electric Aviation.
October 2015	First flight completed on EMD aircraft.
April 2016	LRIP Lot 1 Advanced Acquisition Contract (AAC) awarded.
August 2016	Four EMD aircraft in flight test.
September 2016	Contract awarded for two additional SDTA aircraft to demonstrate that manufacturing processes are both mature and under control.
October 2016	Program successfully completed an initial Operational Assessment (OT-B1) in West Palm Beach, Florida.
January 2017	Letter of Request for Pricing and Availability received from Israel.
April 2017	USD (AT&L) signed the Milestone C ADM authorizing procurement of up to 26 aircraft. APB update approved.
May 2017	LRIP Lot 2 AAC awarded.
July 2017	Letter of Offer and Acceptance issued to Germany for potential Direct Commercial Sales.
August 2017	LRIP Lot 1 contract awarded for 2 aircraft.
November 2017	CH-53K Program was re-designated from an ACAT 1D to ACAT 1C Program.
February 2018	LRIP Lot 3 AAC awarded.
January 2019	A program deviation was reported for a breach to APB Schedule milestones for TECHEVAL Complete, IOT&E (OPEVAL) Complete, IOC and FRP Decision Review as a result of inefficiencies in test event accomplishment, technical discoveries in test, and completion of design solutions and correction of deficiencies.
March 2019	ASN(RDA) signed an ADM approving a proposed program restructure as a result of technical issues during the developmental test program that have resulted in a lower test event execution rate than planned, impacting test execution, program schedule, and cost. The plan prioritizes

	System Development and Demonstration activities, provides a deployable configuration in a timely manner and within available budgetary resources in support of IOC.
May 2019	LRIP Lot 2 and LRIP Lot 3 Contract awarded for 5 aircraft in FY18 and 7 aircraft in FY19.
August 2019	Lot 4 AAC awarded.
October 2019	An Acquisition Strategy Update/Addendum was approved to (1) address continuation of the SDD activities to resolve technical issues and complete testing; (2) add two additional Low Rate Initial Production (LRIP) lots and an increase in LRIP aircraft quantities, and (3) update the planned program costs and schedule.
November 2019	A revised Acquisition Program Baseline was approved to update schedule milestones and program costs in accordance with the revised Acquisition Strategy.
January 2020	An Acquisition Decision Memorandum (ADM) was signed by ASN(RDA) and Assistant Commandant of the Marine Corps to approve two additional Low Rate Initial Production (LRIP) lots, an increase in LRIP aircraft quantities, and a full funding commitment from the USMC.

Threshold Breaches

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

Explanation of Breach

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

Schedule

Schedule Events					
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	
Milestone B DAB Review	Dec 2005	Dec 2005	Dec 2005	Dec 2005	
CDR	Jul 2010	Jul 2010	Jul 2010	Jul 2010	
Milestone C	Mar 2017	Apr 2017	Apr 2017	Apr 2017	
TECHEVAL Complete	Apr 2019	Dec 2020	Jun 2021	Dec 2020	(Ch-1)
IOC	Dec 2019	Sep 2021	Jun 2022	Sep 2021	
IOT&E (OPEVAL) Complete	Dec 2019	Dec 2021	Jun 2022	Dec 2021	(Ch-1)
FRP Decision Review	Sep 2020	Nov 2022	May 2023	Nov 2022	(Ch-1)

Change Explanations

(Ch-1) The TECHEVAL Complete, IOT&E (OPEVAL) Complete, and FRP Decision Review current estimate have changed due to refinement of the CH-53K schedule in accordance with the revised Acquisition Strategy, approved October 31, 2019 and alignment with the revised APB, approved November 26, 2019. TECHEVAL Complete changed from January 2021 to December 2020, IOT&E (OPEVAL) Completed changed from September 2021 to December 2021, and FRP Decision Review changed from June 2022 to November 2022.

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).
TECHEVAL - Technical Evaluation

Performance

Performance Characteristics				
SAR Baseline Production Estimate	**Current APB Production Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Net Ready (NR)				
Satisfy 100% of NR reqts in 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)				
(T=O) 2.6 sorties/ 2.25 hrs	(T=O) 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

CH-53K CPD dated March 15, 2017

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
O - Objective
reqts - Requirements
T - Threshold

Track to Budget

RDT&E

Appn	BA	PE
Navy 1319	05	0605212M

Project	Name
3059	CH-53K Development
Notes:	FY2019 - FY2025
9999	Congressional Add
Notes:	FY2019

Appn	BA	PE
Navy 1319	05	0605212N

Project	Name	
3059	CH-53K Development	(Sunk)
Notes:	FY2002 - FY2018	

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

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2017 $M			BY 2017 $M	TY $M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	7265.0	8233.3	9056.6	8274.0	6957.8	8048.2	8097.8
Procurement	20427.5	21295.7	23425.3	21446.1	24263.3	25812.5	25925.2
Flyaway	--	--	--	18590.3	--	--	22513.4
Recurring	--	--	--	18059.0	--	--	21867.1
Non Recurring	--	--	--	531.3	--	--	646.3
Support	--	--	--	2855.8	--	--	3411.8
Other Support	--	--	--	2173.7	--	--	2618.3
Initial Spares	--	--	--	682.1	--	--	793.5
MILCON	13.3	13.3	14.6	13.3	13.2	13.3	13.2
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	27705.8	29542.3	N/A	29733.4	31234.3	33874.0	34036.2

Current APB Cost Estimate Reference

NAVAIR 4.2 Cost Estimate dated October 10, 2019

Cost Notes

CAPE Cost Risks:

(1) Lot 1 LRIP production estimate reflects a cost overrun, primarily due to system engineering and program management costs. Revised system engineering and program management projections to reflect realization of cost overrun.

(2) The Lot 2 and 3 airframe production contract was awarded in May 2019, including a contract clause for shared risk with industry in minimizing Development and Production concurrency. Estimates for Lot 2 and 3 incorporate government share of concurrency risk. Estimates for lot 4 and subsequent lots assume aircraft configuration stability.

The RDT&E cost estimate for program has been updated to include the Program's RDT&E Above Threshold Reprogramming (ATR) request of $158M and revised estimate to complete IOT&E and development program $727M . The Production cost estimate was updated to reflect the current quantity profile from FY 2021 President's Budget, which increased the planned production by two years (into FY2030), this also reflects shifting SDTAs 5 and 6 Aircraft from RDT&E to Production.

The total program of record quantity remains at 200 aircraft.

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

Cost and Funding

Funding Summary

Appropriation Summary FY 2021 President's Budget / December 2019 SAR (TY$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	6532.1	507.0	406.4	361.3	231.9	40.6	18.5	0.0	8097.8
Procurement	2739.0	1146.4	1156.2	1508.2	1583.6	2145.5	2663.3	12983.0	25925.2
MILCON	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2021 Total	9284.3	1653.4	1562.6	1869.5	1815.5	2186.1	2681.8	12983.0	34036.2
PB 2020 Total	9174.8	1638.5	1990.6	2309.5	2223.8	2370.9	3086.6	8735.1	31529.8
Delta	109.5	14.9	-428.0	-440.0	-408.3	-184.8	-404.8	4247.9	2506.4

Funding Notes

Prior year includes two congressional add aircraft.

Quantity Summary FY 2021 President's Budget / December 2019 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
Development	4	0	0	0	0	0	0	0	0	4
Production	0	14	6	7	11	12	18	23	105	196
PB 2021 Total	4	14	6	7	11	12	18	23	105	200
PB 2020 Total	6	16	6	12	19	18	19	25	79	200
Delta	-2	-2	0	-5	-8	-6	-1	-2	26	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
		TY $M					
Fiscal Year	Quantity	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	--	--	--	--	--	--	98.9
2006	--	--	--	--	--	--	251.9
2007	--	--	--	--	--	--	338.1
2008	--	--	--	--	--	--	386.2
2009	--	--	--	--	--	--	541.9
2010	--	--	--	--	--	--	503.9
2011	--	--	--	--	--	--	562.2
2012	--	--	--	--	--	--	604.4
2013	--	--	--	--	--	--	535.5
2014	--	--	--	--	--	--	446.7
2015	--	--	--	--	--	--	533.2
2016	--	--	--	--	--	--	563.1
2017	--	--	--	--	--	--	339.0
2018	--	--	--	--	--	--	434.1
2019	--	--	--	--	--	--	383.6
2020	--	--	--	--	--	--	507.0
2021	--	--	--	--	--	--	406.4
2022	--	--	--	--	--	--	361.3
2023	--	--	--	--	--	--	231.9
2024	--	--	--	--	--	--	40.6
2025	--	--	--	--	--	--	18.5
Subtotal	4	--	--	--	--	--	8097.8

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2017 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	2.6
2003	--	--	--	--	--	--	3.5
2004	--	--	--	--	--	--	5.8
2005	--	--	--	--	--	--	119.9
2006	--	--	--	--	--	--	296.1
2007	--	--	--	--	--	--	388.0
2008	--	--	--	--	--	--	435.2
2009	--	--	--	--	--	--	602.9
2010	--	--	--	--	--	--	552.4
2011	--	--	--	--	--	--	601.9
2012	--	--	--	--	--	--	636.5
2013	--	--	--	--	--	--	558.1
2014	--	--	--	--	--	--	459.0
2015	--	--	--	--	--	--	541.1
2016	--	--	--	--	--	--	561.4
2017	--	--	--	--	--	--	332.0
2018	--	--	--	--	--	--	415.2
2019	--	--	--	--	--	--	359.8
2020	--	--	--	--	--	--	466.2
2021	--	--	--	--	--	--	366.3
2022	--	--	--	--	--	--	319.3
2023	--	--	--	--	--	--	200.9
2024	--	--	--	--	--	--	34.5
2025	--	--	--	--	--	--	15.4
Subtotal	4	--	--	--	--	--	8274.0

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	322.4	--	35.0	357.4	135.2	492.6
2018	5	792.7	--	44.4	837.1	189.5	1026.6
2019	7	908.2	--	3.9	912.1	266.4	1178.5
2020	6	849.6	--	30.4	880.0	266.4	1146.4
2021	7	819.1	--	44.1	863.2	293.0	1156.2
2022	11	1258.3	--	24.2	1282.5	225.7	1508.2
2023	12	1485.9	--	2.4	1488.3	95.3	1583.6
2024	18	1986.7	--	31.2	2017.9	127.6	2145.5
2025	23	2442.4	--	46.3	2488.7	174.6	2663.3
2026	24	2737.0	--	65.0	2802.0	331.4	3133.4
2027	24	2603.1	--	62.2	2665.3	323.0	2988.3
2028	24	2481.4	--	92.4	2573.8	326.7	2900.5
2029	24	2194.9	--	87.6	2282.5	310.2	2592.7
2030	9	944.1	--	77.2	1021.3	176.5	1197.8
2031	--	--	--	--	--	85.9	85.9
2032	--	--	--	--	--	84.4	84.4
Subtotal	196	21867.1	--	646.3	22513.4	3411.8	25925.2

Annual Funding 1506 | Procurement | Aircraft Procurement, Navy							
Fiscal Year	Quantity	BY 2017 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	40.6	--	--	40.6	--	40.6
2017	2	310.4	--	33.7	344.1	130.2	474.3
2018	5	749.3	--	42.0	791.3	179.1	970.4
2019	7	841.8	--	3.6	845.4	247.0	1092.4
2020	6	772.1	--	27.6	799.7	242.1	1041.8
2021	7	729.8	--	39.3	769.1	261.0	1030.1
2022	11	1099.1	--	21.1	1120.2	197.1	1317.3
2023	12	1272.4	--	2.1	1274.5	81.6	1356.1
2024	18	1667.9	--	26.2	1694.1	107.1	1801.2
2025	23	2010.3	--	38.1	2048.4	143.7	2192.1
2026	24	2208.6	--	52.5	2261.1	267.3	2528.4
2027	24	2059.3	--	49.2	2108.5	255.6	2364.1
2028	24	1924.6	--	71.7	1996.3	253.3	2249.6
2029	24	1669.0	--	66.6	1735.6	235.9	1971.5
2030	9	703.8	--	57.6	761.4	131.5	892.9
2031	--	--	--	--	--	62.8	62.8
2032	--	--	--	--	--	60.5	60.5
Subtotal	196	18059.0	--	531.3	18590.3	2855.8	21446.1

Cost Quantity Information 1506 | Procurement | Aircraft Procurement, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2017 $M**
2016	--	--
2017	2	281.7
2018	5	698.5
2019	7	862.4
2020	6	676.3
2021	7	745.9
2022	11	1085.9
2023	12	1132.1
2024	18	1629.4
2025	23	2010.8
2026	24	2104.9
2027	24	2075.8
2028	24	2022.1
2029	24	1893.2
2030	9	840.0
2031	--	--
2032	--	--
Subtotal	196	18059.0

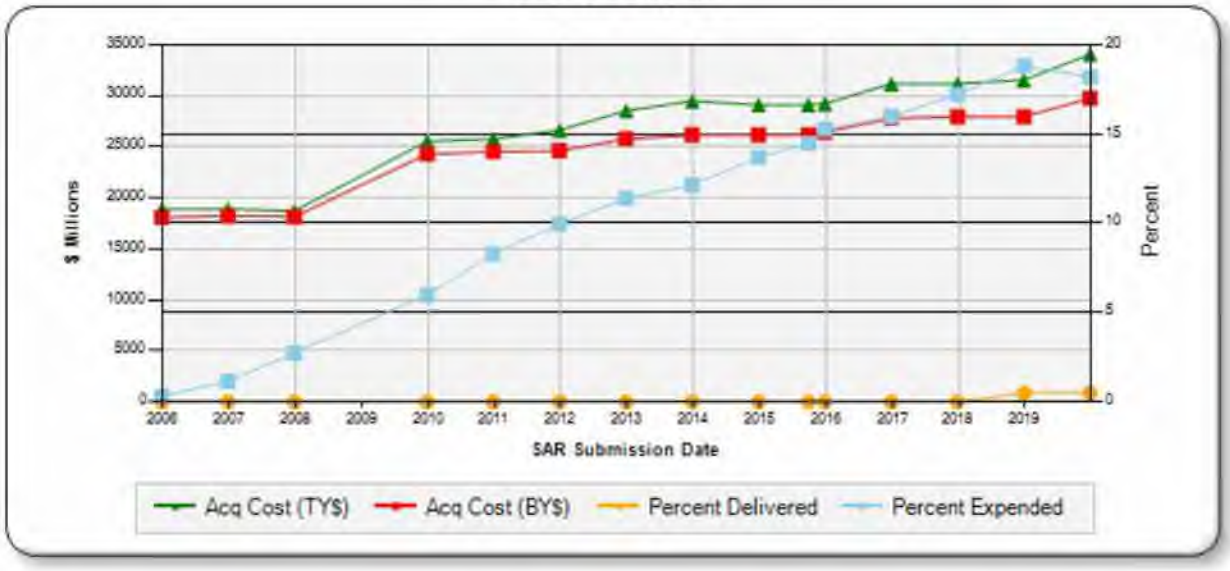
Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**TY $M** **Total Program**
2014	13.2
Subtotal	13.2

Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**BY 2017 $M** **Total Program**
2014	13.3
Subtotal	13.3

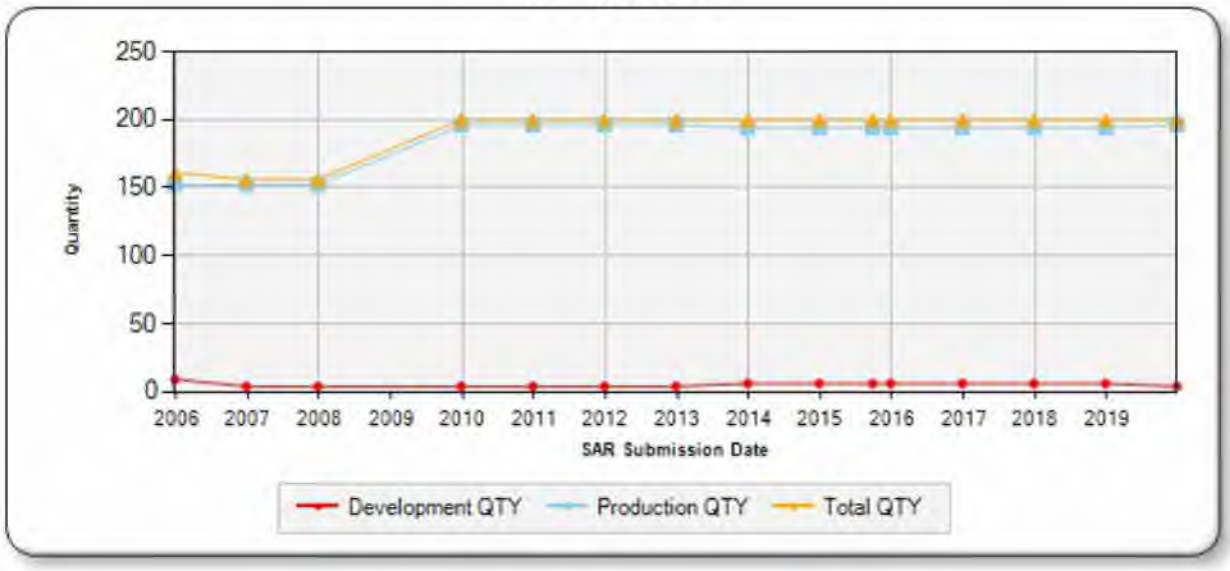
Charts

CH-53K first began SAR reporting in December 2005

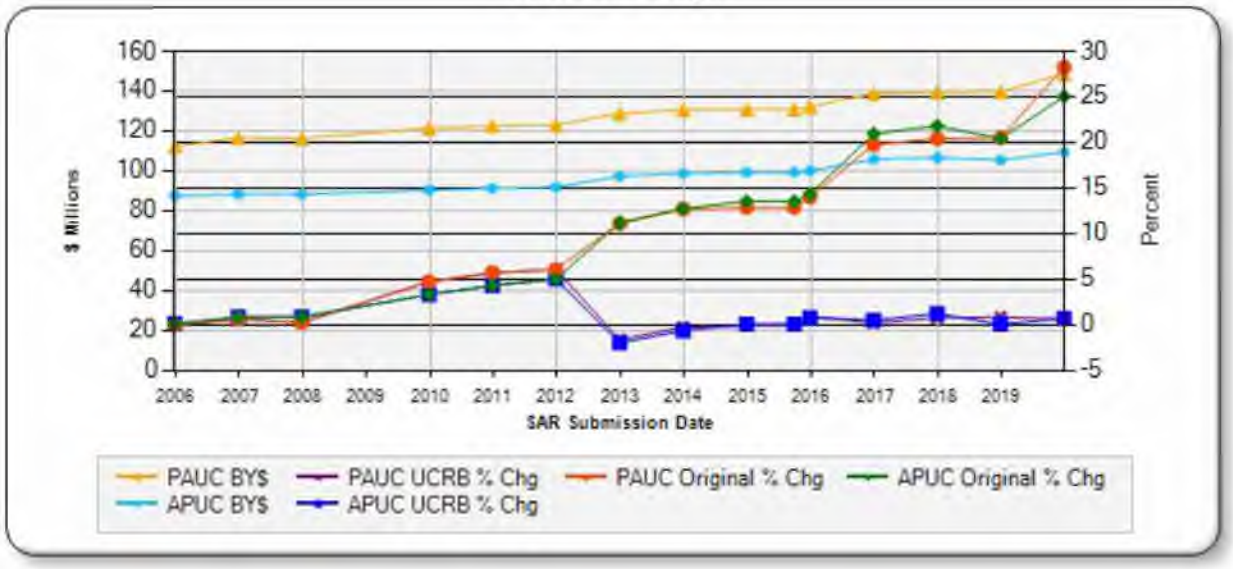
Program Acquisition Cost - CH-53K
Base Year 2017 $M



Quantity - CH-53K



Unit Cost - CH-53K
Base Year 2017 $M



Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Milestone B (December 2005)	
1.	Technology Maturation – Feasibility of Lift Capability
2.	Program Staffing Levels
3.	Operational Temperatures – Avionics Cooling
4.	Engine Exhaust Gas Re-ingestion
5.	Software Development
6.	Capacity Off-Load
7.	Personnel and Facility Resources
Milestone C (April 2017)	
1.	Flight Test Completion to Support IOC
2.	Final Assembly Transition
3.	Flight Test and Production Concurrency
4.	SDTA 1-4 A/C Ready for IOT&E
5.	Main Rotor Damper Performance
6.	Engine Bay Elevated Operation Temperatures & Fire Protection Deficiency
Current Estimate (December 2019)	
1.	The program plan to IOC provides for a technically viable and deployable configuration that meets KPPs. Mission Performance (carrying a 27,000 lb payload 'ship to shore' in hot day conditions) is at risk pending design solutions from identified technical deficiencies in developmental flight test, most notably the Exhaust Gas Re-ingestion (EGR) issue causing engine stall. Redesign and flight demonstration of the EGR resolution was completed in December 2019, which significantly mitigated this risk. Completion of design solutions and developmental testing for remaining technical deficiencies is expected to be completed by the end of FY 2020.(T)

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (November 2019)	
1.	Previous insufficiencies in RDT&E funding caused by delays in developmental test and slow resolution of technical deficiencies have been resolved and the program is proceeding with the planned development effort. The program is executing an Over Target Baseline (OTB) and Over Target Schedule (OTS) on System Development and Demonstration (SDD) Contract to ensure alignment between performance measurement baseline and program execution, planned to be completed in March 2020.
Original Baseline Estimate (December 2005)	
1.	Total program costs - Cost Analysis Improvement Group (CAIG) was 4% higher than POE. SDD costs due to labor and material - CAIG estimate was 8% higher due to contractor fee, total engineering development effort, and engineering change orders. Procurement costs - CAIG estimate was 12% higher than POE (mostly due to airframe material and production support costs). O&S effort - CAIG estimate was 1% lower than POE.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2019)	
1.	Lot 1 LRIP production is projecting a cost overrun, primarily due to sustaining engineering and program management costs. The Lot 2 and 3 production contract was awarded in May 2019, including a contract clause for shared risk with industry in minimizing Development and Production concurrency.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	11/22/2005	1/6/2020
Approved Quantity	29	38
Reference	Milestone B Acquisition Strategy (AS)	CH-53K LRIP ADM
Start Year	2012	2017
End Year	2015	2022

The Current Total LRIP Quantity is more than 10% of the total production quantity and was approved at Milestone C. Two additional LRIP Lots were approved in an ADM approved on January 6, 2020, which increased the percentage from 13% to 19%. The increase in aircraft quantity is necessary to maintain continuity in production pending completion of Initial Operational Test and Evaluation (IOT&E), planned in first quarter FY 2022. The two additional LRIP Lots support resolution of identified deficiencies, manufacturing maturation, and completion of Full Rate Production entrance criteria.

Foreign Military Sales

None

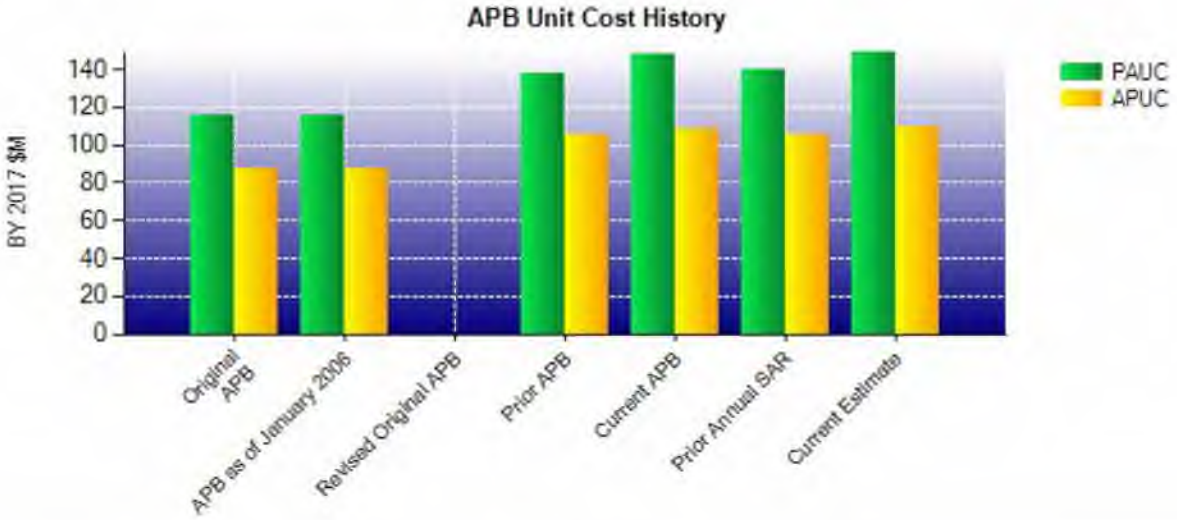
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2017 $M Current UCR Baseline (Nov 2019 APB)	BY 2017 $M Current Estimate (Dec 2019 SAR)	% Change
Program Acquisition Unit Cost			
Cost	29542.3	29733.4	
Quantity	200	200	
Unit Cost	147.712	148.667	+0.65
Average Procurement Unit Cost			
Cost	21295.7	21446.1	
Quantity	196	196	
Unit Cost	108.652	109.419	+0.71

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2017 $M Original UCR Baseline (Dec 2005 APB)	BY 2017 $M Current Estimate (Dec 2019 SAR)	% Change
Program Acquisition Unit Cost			
Cost	18084.4	29733.4	
Quantity	156	200	
Unit Cost	115.926	148.667	+28.24
Average Procurement Unit Cost			
Cost	13301.6	21446.1	
Quantity	152	196	
Unit Cost	87.511	109.419	+25.03



APB Unit Cost History					
Item	Date	BY 2017 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Dec 2005	115.926	87.511	120.297	94.736
APB as of January 2006	Dec 2005	115.926	87.511	120.297	94.736
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Apr 2017	138.529	105.296	156.172	125.069
Current APB	Nov 2019	147.712	108.652	169.370	131.696
Prior Annual SAR	Dec 2018	139.730	105.385	157.649	125.279
Current Estimate	Dec 2019	148.667	109.419	170.181	132.271

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY $M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
120.297	0.037	-10.579	18.691	-0.019	24.904	0.000	2.841	35.875	156.172

Current SAR Baseline to Current Estimate (TY $M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
156.172	-0.468	0.659	3.728	0.000	10.254	0.000	-0.164	14.009	170.181

Initial SAR Baseline to Current SAR Baseline (TY $M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
94.736	-0.082	-5.412	12.974	0.000	20.258	0.000	2.595	30.333	125.069

Current SAR Baseline to Current Estimate (TY $M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
125.069	-0.518	-0.210	2.275	0.000	5.823	0.000	-0.168	7.202	132.271

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	Dec 2005	Dec 2005
Milestone C	N/A	Dec 2012	Mar 2017	Apr 2017
IOC	N/A	Sep 2015	Dec 2019	Sep 2021
Total Cost (TY $M)	N/A	18766.3	31234.3	34036.2
Total Quantity	N/A	156	200	200
PAUC	N/A	120.297	156.172	170.181

Cost Variance

Summary TY $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	6957.8	24263.3	13.2	31234.3
Previous Changes				
Economic	+3.7	-42.9	+0.1	-39.1
Quantity	--	--	--	--
Schedule	+299.8	+63.6	--	+363.4
Engineering	--	--	--	--
Estimating	-48.9	+162.6	-0.1	+113.6
Other	--	--	--	--
Support	--	-142.4	--	-142.4
Subtotal	+254.6	+40.9	--	+295.5
Current Changes				
Economic	+4.1	-58.6	-0.1	-54.6
Quantity	-76.9	+209.0	--	+132.1
Schedule	--	+382.3	--	+382.3
Engineering	--	--	--	--
Estimating	+958.2	+978.8	+0.1	+1937.1
Other	--	--	--	--
Support	--	+109.5	--	+109.5
Subtotal	+885.4	+1621.0	--	+2506.4
Total Changes	+1140.0	+1661.9	--	+2801.9
Current Estimate	8097.8	25925.2	13.2	34036.2

Summary BY 2017 $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	7265.0	20427.5	13.3	27705.8
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	+275.8	+13.0	--	+288.8
Engineering	--	--	--	--
Estimating	-52.7	+156.6	-0.1	+103.8
Other	--	--	--	--
Support	--	-152.5	--	-152.5
Subtotal	+223.1	+17.1	-0.1	+240.1
Current Changes				
Economic	--	--	--	--
Quantity	-73.5	+155.8	--	+82.3
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+859.4	+808.5	+0.1	+1668.0
Other	--	--	--	--
Support	--	+37.2	--	+37.2
Subtotal	+785.9	+1001.5	+0.1	+1787.5
Total Changes	+1009.0	+1018.6	--	+2027.6
Current Estimate	8274.0	21446.1	13.3	29733.4

Previous Estimate: December 2018

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+4.1
Quantity reduction to reflect decrease of 2 SDTA aircraft (SDTA 5 & 6); remaining funding realigned to complete IOT&E and development program (Navy). (Quantity)	-73.5	-76.9
Adjustment for current and prior escalation. (Estimating)	-3.0	-3.2
Revised estimate to reflect actuals (Navy). (Estimating)	-0.2	-0.2
Revised estimate due to schedule growth to complete IOT&E and development program (Navy). (Estimating)	+144.0	+151.4
Revised estimate due to Above Threshold Reprogramming (ATR) to complete IOT&E and development program (Navy). (Estimating)	+718.6	+810.2
RDT&E Subtotal	+785.9	+885.4

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-58.6
Revised estimate to reflect increased aircraft quantity from 194 to 196 to replace SDTA 5 & 6 (Quantity)	+155.8	+209.0
Revised estimate to reflect stretch-out of procurement buy profile. Quantity profile rephased to add two years of production (FY29 & FY30). (Schedule)	0.0	+382.3
Adjustment for current and prior escalation. (Estimating)	+5.9	+6.4
Revised estimate to reflect the application of new outyear escalation indices. (Estimating)	-42.1	-50.8
Revised estimate for updated engine contract material costs. (Estimating)	+333.9	+404.5
Revised estimate for updated production costs due to System Engineering and Production Management costs. (Estimating)	+56.1	+65.5
Revised estimate for contract award and production overrun. (Estimating)	+163.3	+173.1
Revised estimate for production costs based on updated Learning Curve data and technical corrections. (Estimating)	+291.4	+380.1
Adjustment for current and prior escalation. (Support)	+1.9	+2.0
Revised estimate to reflect decrease in Other Support. (Support)	-27.0	+25.3
Increase in Initial Spares due to a change in the estimate. (Support)	+62.3	+82.2
Procurement Subtotal	+1001.5	+1621.0

MILCON	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.1
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
MILCON Subtotal	+0.1	0.0

Change Explanations Notes

Other Support variance in Procurement is negative in Base Year and positive in Then Year because support changes

moved requirements from early to later in the program.

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	3010.0	N/A	5	5344.3	4585.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to an increase in scope on the contract to complete aircraft configuration changes.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (6/30/2019)	-517.2	-180.7
Previous Cumulative Variances	-429.0	-118.7
Net Change	-88.2	-62.0

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Flight Test discovery during this period and technical issue resolution, as well as material movement due to the Material Requirements Planning (MRP) system's grouping, pegging, and distribution (GPD) re-pegging process, and support for the exhaust gas re-ingestion (EGR) issue. Additionally, this contract is in the process of implementing an Over Target Baseline (OTB), which will result in an updated baseline plan for all remaining scope work. OTB completion is expected in March 2020.

The unfavorable net change in the schedule variance is due to Flight Test discovery during this period that resulted in less Flight Test execution efficiencies, as well as technical issue resolution and additional support required for the EGR issue. Additionally, this contract is in the process of implementing an OTB, which will result in an updated baseline plan for all remaining scope work. OTB completion is expected in March 2020.

Notes

Technical issues identified during the developmental test program have resulted in significant cost overruns and schedule delays on the SDD contract. In order to rebaseline the contract to execute engineering design work for correction of deficiencies, resolution of technical issues, and continuation of developmental flight test, an Over Target Baseline (OTB)/Over Target Schedule (OTS) was initiated for the SDD Contract (CLIN 0004 SDD only) on July 1, 2019. The OTB/OTB blackout period is in effect and only limited EVM data will be submitted until completion (estimated March 2020). The latest EVM data is from June 2019.

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	798.9	N/A	6	753.6	831.5

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 to complete aircraft configuration change, plus two additional aircraft.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2019)	+8.1	-21.7
Previous Cumulative Variances	-9.3	-49.3
Net Change	+17.4	+27.6

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to efficiencies in supportability management, program management LOE, and supply chain management.

The favorable net change in the schedule variance is due to contract modification P00266, which directed the contractor to DD250 SDTA Aircrafts 5 and 6, resulting in a descope of approximately $126M. The SDTA 5 and 6 descope removed approximately $123M of unfavorable schedule variance.

Contract Identification

Appropriation: Procurement
Contract Name: LRIP 1
Contractor: Sikorsky Aircraft Corporation
Contractor Location: 6900 Main Street
Stratford, CT 06615-9129
Contract Number: N00019-16-C-0048/3
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: April 18, 2016
Definitization Date: August 30, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
25.0	25.0	0	367.4	367.4	2	278.3	298.3

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to definitization of the contract to fully fund LRIP 1. The Initial Award reflects the Advanced Acquisition Contract (AAC) award for procurement of long lead materials. Total also includes incorporation of Aircraft Change Notices to update aircraft configuration resulting from concurrent Systems Development and Demonstration.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (11/30/2019)	-1.6	-29.2
Previous Cumulative Variances	--	--
Net Change	-1.6	-29.2

Cost and Schedule Variance Explanations

The unfavorable cumulative cost variance is due to greater than expected support needed for Airframe Engineering Technical Assistance.

The unfavorable cumulative schedule variance is due to inefficiencies during Aircraft 7 final assembly.

Contract Identification

Appropriation: Procurement
Contract Name: LRIP 2
Contractor: Sikorsky Aricraft Corporation
Contractor Location: 6900 Main Street
Stratford, CT 06615
Contract Number: N00019-16-C-0048
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: May 22, 2017
Definitization Date: May 17, 2019

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
55.5	55.5	0	555.8	595.0	5	496.6	496.8

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to definitization of the contract to fully fund LRIP 2. The Initial Contract Price reflects the Advanced Acquisition Contract (AAC) award for procurement of long lead materials.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2019)	-0.6	-0.2
Previous Cumulative Variances	--	--
Net Change	-0.6	-0.2

Cost and Schedule Variance Explanations

The unfavorable cumulative cost variance is due to fact that, since this is the first year of reporting for Lot 2 and minimal work has been completed, there is minimal cost variance.

The unfavorable cumulative schedule variance is due to fact that, since this is the first year of reporting for Lot 2 and minimal work has been completed, there is minimal schedule variance.

Notes

This contract was named "AAC Lot 2" in previous SAR. It has been corrected to more accurately reflect LRIP 2. In addition, the Initial Contract Price Ceiling was corrected from "N/A" to "$55M" and Quantity from "4 " to "0" because initial award included only long lead materials up to $55M and the aircraft quantity was zero until the contract was definitized.

Contract Identification

Appropriation: Procurement
Contract Name: LRIP 3
Contractor: Sikorsky Aircraft Corporation
Contractor Location: 6900 Main Street
Stratford, CT 06614
Contract Number: N00019-16-C-0048/5
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: February 13, 2018
Definitization Date: May 17, 2019

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
126.5	126.5	0	744.2	819.8	7	687.7	687.2

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to definitization of the contract to fully fund LRIP 3. The Initial Award reflects the Advanced Acquisition Contract (AAC) award for procurement of long lead materials.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2019)	+2.2	0.0
Previous Cumulative Variances	--	--
Net Change	+2.2	+0.0

Cost and Schedule Variance Explanations

The favorable cumulative cost variance is due to fact that, since this is the first year of reporting for Lot 3 and minimal work has been completed, there is minimal cost variance.

Contract Identification

Appropriation: Procurement
Contract Name: LRIP Lot 1, 2, and 3 Engines
Contractor: General Electric Aviation
Contractor Location: 1000 Western Avenue
Lynn, MA 01905
Contract Number: N00019-18-C-1007
Contract Type: Firm Fixed Price (FFP)
Award Date: November 16, 2017
Definitization Date: November 16, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
143.4	N/A	22	287.9	N/A	50	287.9	287.9

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to award of additional engines and spares for LRIP Lot 3 aircraft. The Initial Contract Price included LRIP Lot 1 and 2 engines and spares.

Cost and Schedule Variance Explanations

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

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	1	1	4	25.00%
Production	0	0	196	0.00%
Total Program Quantity Delivered	1	1	200	0.50%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	34036.2	Years Appropriated	19
Expended to Date	6189.3	Percent Years Appropriated	61.29%
Percent Expended	18.18%	Appropriated to Date	10937.7
Total Funding Years	31	Percent Appropriated	32.14%

The above data is current as of February 10, 2020.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	February 10, 2020
Source of Estimate:	POE
Quantity to Sustain:	200
Unit of Measure:	Aircraft
Service Life per Unit:	30.00 Years
Fiscal Years in Service:	FY 2020 - FY 2061

- 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 / 2 reserve) / 1 Marine Training (HMHT) squadron
- Helicopters per HMH (active) squadron: 16
- Helicopters per HMH (reserve) squadron: 8
- Helicopters per HMHT squadron: 21
- Monthly Flight Hours per Helicopter (Primary Aircraft Authorized (PAA)): 17.9
- PB 2020 budgeted flight hours applied in the FYDP
- Aircraft reliability projections per NAVAIR-4.1.10 input
- Total Operating Helicopter Years: 5,032 (Phase-in of PAA required, 30 years operating life per aircraft, phase-out of PAA)

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. For components determined to require organic repair capability, a time-phased entry approach will be utilized to enable optimization of capacity as well as stabilization of repair processes and ensure repair capability will be established no later than IOC +4 years. 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 Operation 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 2014 to FY 2016 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 (BY 2017$) = CH-53E Annual O&S Cost per Helicopter * CH-53K Total Operating Helicopter Years
- Historical data is unavailable for all years of the Antecedent System's life cycle and the calculation is supplemented with CH-53K data

Annual O&S Costs BY2017 $M		
Cost Element	**CH-53K Average Annual Cost Per Aircraft**	**CH-53E (Antecedent) Average Annual Cost Per Aircraft**
Unit-Level Manpower	1.266	1.579
Unit Operations	0.365	0.282
Maintenance	5.563	3.912
Sustaining Support	0.309	0.151
Continuing System Improvements	0.893	0.417
Indirect Support	0.773	0.963
Other	0.000	0.000
Total	9.169	7.304

Item	Total O&S Cost $M			
	CH-53K			CH-53E (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	46261.2	50887.3	46139.0	36756.2
Then Year	81015.6	N/A	81466.7	N/A

Equation to Translate Annual Cost to Total Cost

- Total O&S Cost (BY) / Total Operating Helicopter Years = CH-53K Average Annual Cost per Helicopter
- $46,139.0/ 5,032 = $9.169M

O&S Cost Variance		
Category	**BY 2017 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2018 SAR	45376.7	
Programmatic/Planning Factors	450.1	PB21 Aircraft Delivery and Phasing
Cost Estimating Methodology	0.0	
Cost Data Update	-250.4	2020/PB21 Inflation data, Government Furnished Equipment Pricing Update, PB21 Budget Controls
Labor Rate	-92.7	2020 Military Composite Pay Rates
Energy Rate	0.0	
Technical Input	655.3	Main Rotor Blade Reliability Projection change
Other	0.0	
Total Changes	762.3	
Current Estimate	46139.0	

Disposal Estimate Details

Date of Estimate: February 01, 2020

Source of Estimate: POE

Disposal/Demilitarization Total Cost (BY 2017 $M): 52.3