Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-253

VTUAV

As of December 31, 2010

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Program Information

Designation And Nomenclature (Popular Name)

Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle

DoD Component

Navy

Responsible Office

Responsible Office

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Date Assigned October 12, 2006

References

SAR Baseline (Production Estimate)

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated February 2, 2009.

Approved APB

NAE Approved Acquisition Program Baseline (APB) dated February 2, 2009

Mission and Description

The Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle (VTUAV) program supports the Close Range Reconnaissance, Surveillance and Target Acquisition (RSTA) Capability Mission Need Statement (MNS), validated January 1990. Additionally, the performance attributes of the VTUAV support the Littoral Combat Ship (LCS), the Vertical Unmanned Air Vehicle, the Assured Maritime Access in the Littorals, the Joint Strike Enable (JSE) and the Penetrating Intelligence, Surveillance, and Reconnaissance for Area Denial Threat Environments Initial Capabilities Documents. The VTUAV system also provides varied mission capabilities in support of Sea Power 21.

A VTUAV system is composed of air vehicles, Electro Optic, Infrared, Laser Designator Range Finder payloads (one per air vehicle), Ground Control Stations (GCS), Tactical Control System (TCS) software, Tactical Common Data Link, Unmanned Air Vehicle Common Automatic Recovery System for automatic take-offs and landings, and associated spares and support equipment. The VTUAV launches and recovers vertically and can operate from all air capable ships as well as confined area land bases. Other characteristics include autonomous waypoint navigation with command override capability, a heavy fuel engine, and the ability to incorporate future mission packages. Each GCS will perform mission planning, air vehicle and mission payload control, receive incoming payload data and distribute the data to existing shipboard Command, Control, Communication and Computer Information (C4I) systems.

Executive Summary

The VTUAV was fielded aboard a Guided Missile Frigate (FFG-8, USS McInerney) in FY 2009 with a Military Utility Assessment (MUA) that was intended to support Operational Testing during the same time frame. Reliability issues uncovered during the MUA delayed the Operational Testing events and resolution of the issues caused the program to breach the remaining schedule milestones.

In FY 2010, efforts began to field the system aboard FFG-40 (USS Halyburton) for an additional MUA. Efforts to use this ship to support Operational Testing prior to deployment were unsuccessful due to continued efforts to resolve reliability issues. The program now plans to complete OPEVAL in the first quarter of FY 2012.

Efforts are also underway to field a Fire Scout system to Afghanistan to support the Intelligence, Surveillance and Reconaissance (ISR) Task Force in FY 2011. Additional funding for two landbased Ground Control Stations and spares were added to the FY 2010 budget to support this effort.

Funding was also added to the program in FY 2010 and FY 2012 to begin studies and efforts to integrate a weapon onto the platform.

The program has continued to support the LCS program as a parallel effort. With the delay and changes to the LCS test and evaluation periods over the last year, additional Research, Development, Test and Evaluation (RDT&E) funds were added to VTUAV in the FY 2011 President's Budget to cover the new test periods. The addition of these funds caused an RDT&E threshold breach.

Procurement estimates through out the life of the program were extended by eight years to reflect more realistic production rates. Due to this stretch-out, the unit cost for the air vehicles has increased. The Orginal Acquisition Program Baseline (APB, Base Year 2006) projected that 155 of the 168 production aircraft would be procured by FY 2016. Based on the FY 2012 President's Budget, only 45 of the 168 aircraft will be procured by FY 2016. The lower yearly production rate, at or near a minimum sustaining rate each year, and the increasing number of years required to produce the total aircraft is the major contributor to the growth in Average Procurement Unit Cost (APUC). Note that the unit cost is based on a single air vehicle and the Ground Control Station and Ancillary Equipment costs are amortized in this number.

In the FY 2012 President’s Budget, funding was added to Program Element (PE) 0305231N for an endurance upgrade to VTUAV to fill an interim capability to provide Intelligence, Surveillance, and Reconnaissance (ISR) for Support to Special Operations Forces prior to fielding of a new start Medium Range Maritime Unmanned Air System. These funds, and funds to incorporate a RADAR subprogram, are not addressed in this SAR. Planning for execution of the funding and development of a strategy for acquiring an interim ISR system is ongoing. A program review is being planned for May 2011 with the Milestone Decision Authority, the Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RD&A)), to gain approval for an acquisition strategy for this interim effort and the funding will be reported pending the structure of a formal acquisition effort based on that approved strategy (expected to occur during calendar year 2011).

A total of up to 168 production air vehicles are planned to be procured.

Past software developmental delays have contributed to missing the Acquisition Program Baseline (APB) schedule milestones. Software development for full program functionality has been completed at this time. However, an additional software build will be required to correct deficiencies found in flight testing to support Operational Evaluation.

There are no significant software issues at this time.

Threshold Breaches

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

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

Explanation of Breach

Due to reliability issues uncovered during testing, and susequent ship availability, the program has slipped scheduled milestones by an additional year.

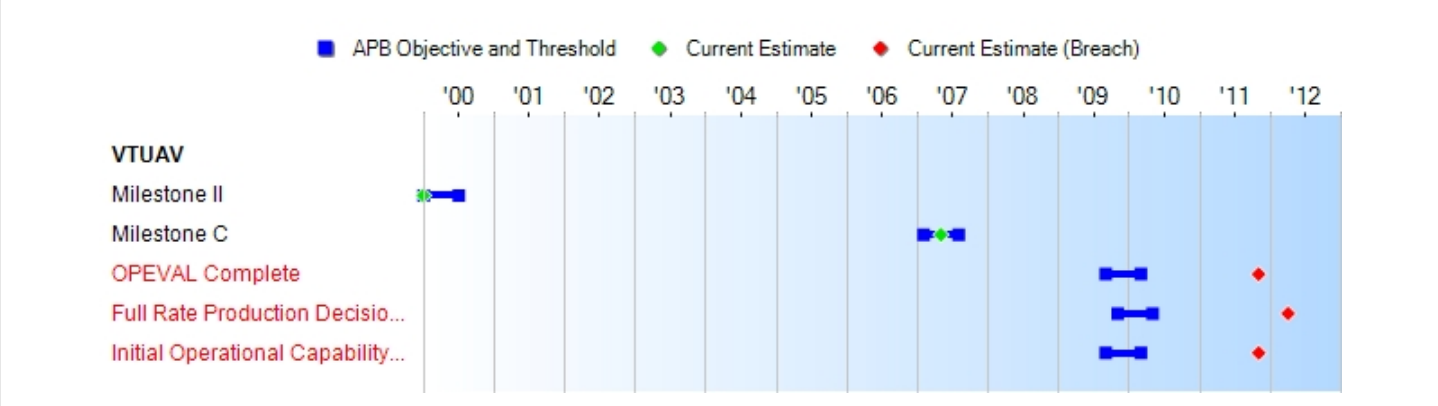
Schedule delays have driven the requirement for additional Research, Development, Test and Evaluation (RDT&E) funds, causing a breach to the RDT&E costs.

Extended buy profile at a minimum sustaining rate and adding eight years of production to the program has driven additional cost causing a procurement breach.

The RDT&E and Procurement breaches have resulted in an overall Average Procurement Unit Cost (APUC) breach for the program.

A revised APB is in routing.

Schedule



Milestones	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate	
Milestone II	JAN 2000	JAN 2000	JUL 2000	JAN 2000	
Milestone C	FEB 2007	FEB 2007	AUG 2007	MAY 2007	
OPEVAL Complete	SEP 2009	SEP 2009	MAR 2010	**NOV 2011**[1]	(Ch-1)
Full Rate Production Decision Review	NOV 2009	NOV 2009	MAY 2010	**APR 2012**[1]	(Ch-1)
Initial Operational Capability (IOC)	SEP 2009	SEP 2009	MAR 2010	**NOV 2011**[1]	(Ch-1)

[1] *APB Breach*

Acronyms And Abbreviations

OPEVAL - Operational Evaluation

Change Explanations

(Ch-1) Since the last SAR, OPEVAL complete has changed from DEC 2010 to NOV 2011, Full Rate Production Decision Review has changed from MAY 2011 to APR 2012, and Initial Operational Capability has changed from DEC 2010 to NOV 2011 due to delays in the completion of Operational Evaluation (OPEVAL). In FY 2009, the system was deployed under a Military Utility Assessment (MUA) aboard the USS McInerney. Reliability issues uncovered during the MUA delayed Operational Testing (OT). In FY 2010, the system was deployed under another MUA aboard the USS Halyburton that was also intended to support the OT. These reliability issues will not be sufficiently resolved in time to complete the OT events prior to the completion of the second MUA.

Memo

The current estimates are based on having an additional ship available to support Operational Testing during the required timeframe.

Performance

Characteristics	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
Automatic Launch/Recovery (Ship Operations)					
Deck Pitch (degrees)	+/- 5	+/- 5	+/-3	+/- 2 at sea; +/- 5 land	+/-5
Deck Roll (degrees)	+/- 8	+/- 8	+/- 5	+/- 5 at sea; +/- 10 land	+/- 8
Target Identification					
Slant Range (km)	16	16	6	10	16
Operational Availability	>= 0.95	>= 0.95	>= 0.85	0.90	>= 0.95
Net-Ready	The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric Military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1. 2) DISR mandated GIG IPs identified in	The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric Military operations to include 1) DISR mandated GIG IT standards and profiles identified in the TV-1. 2) DISR mandated GIG IPs identified in	The system must fully support execution of joint critical operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric Military operations to include 1) ISR mandated GIG IT standards and profiles identified in the TV-1. 2) DISR mandated GIG KIPs identified in	The system has demonstra-ted all Net Ready Capabilities that have been implemented in the host FFG and LCS class ships.	The system must fully support execution of joint critical operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric Military operations to include 1) ISR mandated GIG IT standards and profiles identified in the TV-1. 2) DISR mandated GIG KIPs identified in

	the KIP declaration table. 3) NCOW RW Enterprise Services. 4) IA requirements including availability, integrity, authenticatio n, confidentiality , and issuance of an ATO by the DAA. 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architectural views.	the KIP declaration table. 3) NCOW RW Enterprise Services. 4) IA requirements including availability, integrity, authenticatio n, confidentiality , and issuance of an ATO by the DAA. 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architectural views.	the KIP declaration table. 3) NCOW RW Enterprise Services. 4) IA requirements including availability, integrity, authenticatio n, confidentiality , and issuance of an IATO by the DAA. 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architectural views.		the KIP declaration table. 3) NCOW RW Enterprise Services. 4) IA requirements including availability, integrity, authentica- tion, confidential- ity, and issuance of an IATO by the DAA. 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architectural views.

Requirements Source: Joint Requirements Oversight Council (JROC) approved VTUAV Capability Production Document (CPD) 141-07 June 11, 2007

Acronyms And Abbreviations

ATO - Authority to Operate
AV - Air Vehicle
DAA - Designated Approving Authority
DISR - Defense Information Standards Registry

FFG - Guided Missile Frigate
GCS - Ground Control System
GIG - Global Information Grid
IA - Information Assurance
IATO - Interim Authority to Operate
IP - Information Protocol
ISR - Information Standards Registry
IT - Information Technology
KIP - Key Information Protocol
km - Kilometer
LCS - Littoral Combat Ship
MMP - Modular Mission Payload
N/A - Not Applicable
NCOW RM - Net-Centric Operational Warfare Reference Model
TCS - Tactical Control System
TV - Technical View
VTOL - Vertical Take-off and Landing

Change Explanations

None

Track To Budget

RDT&E				
APPN 1319	BA 07	PE 0305204N	(Navy)	
	Project 2478	Tactical Unmanned Aerial Vehicles/Tactical Control System	(Shared)	(Sunk)
	PU2768, VTUAV			
	Project 2768	Tactical Unmanned Aerial Vehicles/VTUAV	(Shared)	(Sunk)
	PU2768, VTUAV			
	Project 2910	Tactical Unmanned Aerial Vehicles/Joint Technology Center / System Integration Lab	(Shared)	(Sunk)
	PU2768, VTUAV			
	Project 3135	Tactical Unmanned Aerial Vehicles/USMC VUAV	(Shared)	(Sunk)
	PU2768, VTUAV			
	Project 3192	Tactical Unmanned Aerial Vehicles/STUAS		(Sunk)
	PU2768, VTUAV			
	Project 9999	Tactical Unmanned Aerial Vehicles/Congressional Adds		(Sunk)
	PU2768, VTUAV			
APPN 1319	BA 07	PE 0305231N	(Navy)	
	Project 2768	MQ-8 UAV	(Shared)	
	PU2768, MQ-8 UAV			

Projects 2478, 2910, 3135, 3192 and 9999 were part of the same RDT&E Program Element (PE) but are not part of the VTUAV program.

In FY 2010, VTUAV was moved from PE 0305204N to PE 0305231N.

Procurement				
APPN 1506	BA 04	PE 0305231N	(Navy)	
	ICN 044300	MQ-8 Unmanned Air Vehicles (UAV)	(Shared)	
APPN 1506	BA 04	PE 0305204N	(Navy)	
	ICN 044300	Vertical Take-off UAV (VTUAV)		(Sunk)

APPN 1506	BA 06	PE 0305231N	(Navy)
	ICN 0605	Tactical Unmanned Aerial Vehicles / Spares and Repair Parts	(Shared)

In FY10, VTUAV was moved from PE 0305204N to PE 0305231N

Cost and Funding

Cost Summary

Total Acquisition Cost and Quantity

	BY2006 $M			BY2006 $M	TY $M		
Appropriation	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Prod Est	Current APB Production Objective	Current Estimate
RDT&E	541.1	541.1	595.2	**617.1** [1]	530.3	530.3	614.4
Procurement	1522.4	1522.4	1674.6	**1748.9** [1]	1821.5	1821.5	2226.1
Flyaway	1170.1	--	--	1349.2	1410.8	--	1730.3
Recurring	1136.9	--	--	1282.7	1372.0	--	1645.8
Non Recurring	33.2	--	--	66.5	38.8	--	84.5
Support	352.3	--	--	399.7	410.7	--	495.8
Other Support	183.6	--	--	231.1	217.2	--	283.6
Initial Spares	168.7	--	--	168.6	193.5	--	212.2
MILCON	119.6	119.6	131.6	0.0	126.0	126.0	0.0
Acq O&M	183.3	183.3	201.6	0.0	309.3	309.3	0.0
Total	2366.4	2366.4	N/A	2366.0	2787.1	2787.1	2840.5

[1] ***APB Breach***

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	9	9	7
Procurement	168	168	168
Total	177	177	175

Cost and Funding

Funding Summary

Appropriation and Quantity Summary
FY2012 President's Budget / December 2010 SAR (TY$ M)

Appropriation	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
RDT&E	587.2	10.7	16.5	0.0	0.0	0.0	0.0	0.0	614.4
Procurement	294.4	50.9	51.5	57.5	78.2	77.9	85.5	1530.2	2226.1
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2012 Total	881.6	61.6	68.0	57.5	78.2	77.9	85.5	1530.2	2840.5
PB 2011 Total	819.0	61.7	50.9	70.3	90.8	90.8	234.0	1207.3	2624.8
Delta	62.6	-0.1	17.1	-12.8	-12.6	-12.9	-148.5	322.9	215.7

Quantity	Undistributed	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
Development	7	0	0	0	0	0	0	0	0	7
Production	0	20	3	3	3	5	5	6	123	168
PB 2012 Total	7	20	3	3	3	5	5	6	123	175
PB 2011 Total	7	14	3	3	4	6	6	18	114	175
Delta	0	6	0	0	-1	-1	-1	-12	9	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding TY$
1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2000	--	--	--	--	--	--	34.8
2001	--	--	--	--	--	--	66.2
2002	--	--	--	--	--	--	47.8
2003	--	--	--	--	--	--	39.3
2004	--	--	--	--	--	--	36.0
2005	--	--	--	--	--	--	59.1
2006	--	--	--	--	--	--	93.2
2007	--	--	--	--	--	--	100.0
2008	--	--	--	--	--	--	62.8
2009	--	--	--	--	--	--	22.5
2010	--	--	--	--	--	--	25.5
2011	--	--	--	--	--	--	10.7
2012	--	--	--	--	--	--	16.5
Subtotal	**7**	**--**	**--**	**--**	**--**	**--**	**614.4**

Annual Funding BY$
1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2006 $M	Non End Item Recurring Flyaway BY 2006 $M	Non Recurring Flyaway BY 2006 $M	Total Flyaway BY 2006 $M	Total Support BY 2006 $M	Total Program BY 2006 $M
2000	--	--	--	--	--	--	38.6
2001	--	--	--	--	--	--	72.4
2002	--	--	--	--	--	--	51.8
2003	--	--	--	--	--	--	42.0
2004	--	--	--	--	--	--	37.4
2005	--	--	--	--	--	--	59.8
2006	--	--	--	--	--	--	91.5
2007	--	--	--	--	--	--	95.8
2008	--	--	--	--	--	--	59.1
2009	--	--	--	--	--	--	20.9
2010	--	--	--	--	--	--	23.4
2011	--	--	--	--	--	--	9.7
2012	--	--	--	--	--	--	14.7
Subtotal	**7**	**--**	**--**	**--**	**--**	**--**	**617.1**

Annual Funding TY$
1506 | Procurement | Aircraft Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2007	3	32.2	--	3.9	36.1	11.6	47.7
2008	3	32.4	--	1.4	33.8	11.6	45.4
2009	3	31.6	--	3.2	34.8	22.3	57.1
2010	11	109.8	--	5.8	115.6	28.6	144.2
2011	3	27.1	--	1.9	29.0	21.9	50.9
2012	3	30.2	--	1.4	31.6	19.9	51.5
2013	3	39.5	--	1.7	41.2	16.3	57.5
2014	5	56.1	--	1.8	57.9	20.3	78.2
2015	5	56.9	--	2.4	59.3	18.6	77.9
2016	6	61.9	--	2.5	64.4	21.1	85.5
2017	6	70.2	--	4.4	74.6	40.2	114.8
2018	10	98.9	--	5.3	104.2	33.4	137.6
2019	10	89.6	--	4.9	94.5	32.6	127.1
2020	10	90.5	--	4.9	95.4	33.3	128.7
2021	10	91.8	--	5.0	96.8	33.5	130.3
2022	11	100.3	--	5.4	105.7	35.8	141.5
2023	11	101.7	--	5.3	107.0	31.5	138.5
2024	11	103.3	--	5.0	108.3	23.5	131.8
2025	11	104.9	--	4.5	109.4	9.7	119.1
2026	11	106.5	--	4.6	111.1	9.9	121.0
2027	11	108.2	--	4.7	112.9	10.0	122.9
2028	11	102.2	--	4.5	106.7	10.2	116.9
Subtotal	**168**	**1645.8**	**--**	**84.5**	**1730.3**	**495.8**	**2226.1**

Annual Funding BY$
1506 | Procurement | Aircraft Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2006 $M	Non End Item Recurring Flyaway BY 2006 $M	Non Recurring Flyaway BY 2006 $M	Total Flyaway BY 2006 $M	Total Support BY 2006 $M	Total Program BY 2006 $M
2007	3	30.5	--	3.7	34.2	10.9	45.1
2008	3	30.2	--	1.3	31.5	10.8	42.3
2009	3	29.1	--	2.9	32.0	20.6	52.6
2010	11	99.9	--	5.3	105.2	26.0	131.2
2011	3	24.3	--	1.7	26.0	19.6	45.6
2012	3	26.6	--	1.2	27.8	17.6	45.4
2013	3	34.3	--	1.5	35.8	14.1	49.9
2014	5	47.9	--	1.5	49.4	17.3	66.7
2015	5	47.7	--	2.0	49.7	15.7	65.4
2016	6	51.1	--	2.1	53.2	17.3	70.5
2017	6	56.9	--	3.6	60.5	32.6	93.1
2018	10	78.9	--	4.2	83.1	26.6	109.7
2019	10	70.3	--	3.8	74.1	25.6	99.7
2020	10	69.8	--	3.8	73.6	25.6	99.2
2021	10	69.6	--	3.8	73.4	25.4	98.8
2022	11	74.8	--	4.0	78.8	26.7	105.5
2023	11	74.6	--	3.9	78.5	23.0	101.5
2024	11	74.5	--	3.6	78.1	16.9	95.0
2025	11	74.4	--	3.2	77.6	6.8	84.4
2026	11	74.2	--	3.2	77.4	6.9	84.3
2027	11	74.2	--	3.2	77.4	6.8	84.2
2028	11	68.9	--	3.0	71.9	6.9	78.8
Subtotal	**168**	**1282.7**	**--**	**66.5**	**1349.2**	**399.7**	**1748.9**

Low Rate Initial Production

	Initial LRIP Decision	Current Total LRIP
Approval Date	5/29/2007	5/7/2010
Approved Quantity	4	17
Reference	VTUAV MS C ADM signed May 29, 2007	VTUAV Program Review ADM signed July 22, 2010
Start Year	2007	2007
End Year	2007	2011

The Inital Milestone C Acquisition Decision Memorandum (ADM) approved the program to purchase up to four air vehicles, and to buy to budget. This guidance resulted in a purchase of three air vehicles.

LRIP decision on September 30, 2008, authorized purchase of three air vehicles for LRIP 2 and three air vehicles for LRIP 3.

LRIP decision on July 22, 2010, authorized purchase of five air vehicles for LRIP 4 and three air vehicles for LRIP 5.

An additional eight LRIP aircraft were added to the program in FY 2010 as a result of an FY 2010 Congressional add to to fun Overseas Contingency Operations to convert eight Army airframes bought under the Army's Future Combat System program into Navy Fire Scouts. This drives the total procurement of LRIP quantity beyond 10% of the total buy.

Foreign Military Sales

None

Nuclear Cost

None

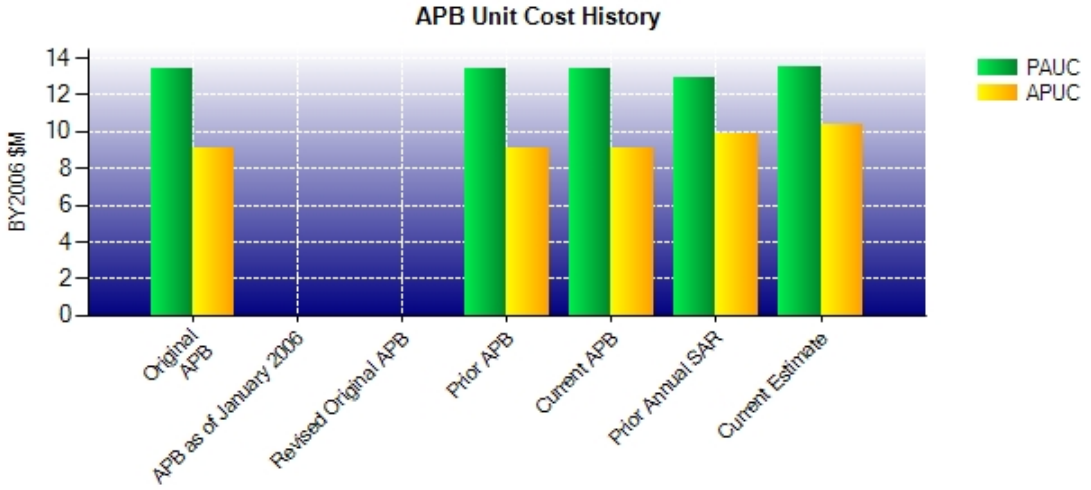
Unit Cost

Unit Cost Report

Unit Cost	BY2006 $M Current UCR Baseline (FEB 2009 APB)	BY2006 $M Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	2366.4	2366.0	
Quantity	177	175	
Unit Cost	13.369	13.520	+1.13
Average Procurement Unit Cost (APUC)			
Cost	1522.4	1748.9	
Quantity	168	168	
Unit Cost	9.062	10.410	+14.88

Unit Cost	BY2006 $M Original UCR Baseline (DEC 2006 APB)	BY2006 $M Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	2366.4	2366.0	
Quantity	177	175	
Unit Cost	13.369	13.520	+1.13
Average Procurement Unit Cost (APUC)			
Cost	1522.4	1748.9	
Quantity	168	168	
Unit Cost	9.062	10.410	+14.88

Unit Cost History



		BY2006 $M		TY $M	
	Date	PAUC	APUC	PAUC	APUC
Original APB	DEC 2006	13.369	9.062	15.746	10.842
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	DEC 2006	13.369	9.062	15.746	10.842
Current APB	FEB 2009	13.369	9.062	15.746	10.842
Prior Annual SAR	DEC 2009	12.957	9.902	14.999	12.051
Current Estimate	DEC 2010	13.520	10.410	16.231	13.251

SAR Unit Cost History

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

Initial PAUC Dev Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
15.746	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.746

Current SAR Baseline to Current Estimate (TY $M)

PAUC Prod Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
15.746	-0.367	0.000	1.067	0.080	-0.845	0.000	0.550	0.485	16.231

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

Initial APUC Dev Est	Changes								APUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.842	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.842

Current SAR Baseline to Current Estimate (TY $M)

APUC Prod Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.842	-0.376	0.000	0.924	0.000	1.287	0.000	0.573	2.408	13.251

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JAN 2000	JAN 2000	JAN 2000
Milestone C	N/A	FEB 2007	FEB 2007	MAY 2007
IOC	N/A	N/A	SEP 2009	NOV 2011
Total Cost (TY $M)	N/A	2787.1	2787.1	2840.5
Total Quantity	N/A	177	177	175
Prog. Acq. Unit Cost (PAUC)	N/A	15.746	15.746	16.231

Cost Variance

Cost Variance Summary

Summary Then Year $M					
	RDT&E	Proc	MILCON	Acq O&M	Total
SAR Baseline (Prod Est)	530.3	1821.5	126.0	309.3	2787.1
Previous Changes					
Economic	-1.2	-59.8	--	--	-61.0
Quantity	--	--	--	--	--
Schedule	--	+69.8	--	--	+69.8
Engineering	--	--	--	--	--
Estimating	+71.1	+162.7	-126.0	-309.3	-201.5
Other	--	--	--	--	--
Support	--	+30.4	--	--	+30.4
Subtotal	+69.9	+203.1	-126.0	-309.3	-162.3
Current Changes					
Economic	+0.1	-3.3	--	--	-3.2
Quantity	--	--	--	--	--
Schedule	--	+85.4	--	--	+85.4
Engineering	+14.0	--	--	--	+14.0
Estimating	+0.1	+53.5	--	--	+53.6
Other	--	--	--	--	--
Support	--	+65.9	--	--	+65.9
Subtotal	+14.2	+201.5	--	--	+215.7
Total Changes	+84.1	+404.6	-126.0	-309.3	+53.4
CE - Cost Variance	614.4	2226.1	--	--	2840.5
CE - Cost & Funding	614.4	2226.1	--	--	2840.5

Summary Base Year 2006 $M					
	RDT&E	Proc	MILCON	Acq O&M	Total
SAR Baseline (Prod Est)	541.1	1522.4	119.6	183.3	2366.4
Previous Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	+62.7	+131.2	-119.6	-183.3	-109.0
Other	--	--	--	--	--
Support	--	+10.0	--	--	+10.0
Subtotal	+62.7	+141.2	-119.6	-183.3	-99.0
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	-2.5	--	--	-2.5
Engineering	+12.5	--	--	--	+12.5
Estimating	+0.8	+50.4	--	--	+51.2
Other	--	--	--	--	--
Support	--	+37.4	--	--	+37.4
Subtotal	+13.3	+85.3	--	--	+98.6
Total Changes	+76.0	+226.5	-119.6	-183.3	-0.4
CE - Cost Variance	617.1	1748.9	--	--	2366.0
CE - Cost & Funding	617.1	1748.9	--	--	2366.0

Previous Estimate: December 2009

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+0.1
Addition of funding to integrate a weapon into VTUAV (Engineering)	+12.5	+14.0
Adjustment for current and prior escalation. (Estimating)	-0.1	-0.1
Increase in funding to account for software delays in completing the System Design and Development (SD&D) contract. (Estimating)	+6.5	+7.0
Changes in funding due to departmental priority shifts (Estimating)	-5.6	-6.8
RDT&E Subtotal	+13.3	+14.2

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	-3.3
Increase due to stretch-out of the air vehicle procurement buy profile from FY20 to FY28 (Schedule)	0.0	+88.2
Additional schedule reduction due to conversion of Army airframes instead of new production buys (Schedule)	-2.5	-2.8
Adjustment to correct the calculated estimate for the schedule impact on the Material Cost and Ground Control Station procurement profile changes (Estimating)	+24.6	+25.2
Adjustment for current and prior escalation. (Estimating)	0.0	-0.1
Revised estimate to reflect actual spares execution from FY 2007 through FY 2011. (Estimating)	+20.9	+22.7
Increase in budget to conduct payload studies (Estimating)	+1.5	+1.7
Revised budget due to departmental priority shifts (Estimating)	-1.5	-1.8
Increase in budget due to actuals from the Low Rate Intitial Production (LRIP) contracts (Estimating)	+4.9	+5.8
Adjustment for current and prior escalation. (Support)	0.0	+0.1
Decrease in Other Support budget due to realignment of the fielding timeline. (Support)	-0.8	+11.8
Increase in Initial Spares costs due to corrections in the model used to calculate the estimate. (Support)	+38.2	+54.0
Procurement Subtotal	+85.3	+201.5

Contracts

Appropriation: Procurement	
Contract Name	**LRIP**
Contractor	Northrop Grumman Corporation
Contractor Location	San Diego, CA 92150-9066
Contract Number, Type	N00019-07-C-0041, FFP
Award Date	June 21, 2007
Definitization Date	April 24, 2008

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
40.3	N/A	3	148.0	N/A	12	148.0	148.0

Cost And Schedule Variance Explanations

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

Contract Comments

The difference between the intial and current contract price is an additional Contract Line Item Number (CLIN) was added to the contract for LRIP 4 this year. A CLIN for LRIP 5 will be awarded in calendar year 2011.

Deliveries and Expenditures

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	7	7	7	100.00%
Production	6	3	168	1.79%
Total Program Quantities Delivered	13	10	175	5.71%

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	2840.5	Years Appropriated	12
Expenditures To Date	743.5	Percent Years Appropriated	41.38%
Percent Expended	26.17%	Appropriated to Date	943.2
Total Funding Years	29	Percent Appropriated	33.21%

Data is current as of February 14, 2011. Production deliveries have been delayed to allow for air vehicle engineering changes to support Intelligence, Surveillance, and Reconaissance (ISR) Task Force land deployment efforts in Afghanistan.

Operating and Support Cost

Assumptions And Ground Rules

- VTUAV Total Average Annual Cost per Aircraft $M: $1.927
- Estimate Duration: Fiscal Year (FY) 2010 to 2035, 26 years with approved flight hours
- Average Flight Hours per Month per Aircraft: 34
- VTUAV Assumptions:
    - Total Procured AV: 168
    - Aircraft Attrition Rate: 7.09 air vehicles per 100,000 hours
    - Aircraft per MH-60R Det: 2 air vehicles
    - Aircraft per MH-60S Det: 1 air vehicle
    - PAA: 92
    - Total Flight Hours over Lifetime: 694,704 FH
    - Avg FH / AV / Year: 405 FH

Costs BY2006 $M		
Cost Element	**VTUAV Average Annual Cost per Air Vehicle**	**No Antecedent N/A**
Unit-Level Manpower	0.329	--
Unit Operations	0.024	--
Maintenance	1.084	--
Sustaining Support	0.163	--
Continuing System Improvements	0.177	--
Indirect Support	0.151	--
Other	--	--
Total Unitized Cost (Base Year 2006 $)	1.928	--

Total O&S Costs $M	VTUAV	No Antecedent
Base Year	3307.0	--
Then Year	5131.3	--

Current SAR report is based on Cost per Air Vehicle in BY06$M

Total O&S Costs for the VTUAV represents the program's current estimate for 168 procured aircraft with a PAA of 92 over the estimate duration of 2010 to 2035. This estimate includes attrition of 7.09 aircraft for every 100,000 flight hours.

Average Annual Cost Per Air Vehicle is calculated by dividing Total O&S Cost by the estimate duration and dividing this by the average number of aircraft over the same period.

Projected Average Flight Hours per month increase from 24.2 to 34 hours, a 40% increase, due to an adjustment in the distribution of Primary Authorized Aircraft (PAA) air vehicles in each year. Estimated service duration also increased 5 years from 2030 to 2035.

There is no antecedent system for this mission.