

RCS: DD-A&T(Q&A)823-212



V-22 Osprey Joint Services Advanced Vertical Lift Aircraft (V-22)

As of FY 2021 President's Budget

Defense Acquisition Management Information Retrieval (DAMIR)

This document contains information that may be exempt from mandatory disclosure under the FOIA.

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs	3
Program Information	5
Responsible Office	5
References	6
Mission and Description	7
(U// FOUO) Executive Summary	8
Threshold Breaches	12
Schedule	13
(U/ /FOUO) Performance	17
Track to Budget	21
Cost and Funding	22
Charts	49
Risks	51
Low Rate Initial Production	53
Foreign Military Sales	54
Nuclear Costs	55
Unit Cost	56
Cost Variance	59
Contracts	63
Deliveries and Expenditures	70
Operating and Support Cost	71

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

V-22 Osprey Joint Services Advanced Vertical Lift Aircraft (V-22)

DoD Component

Navy

Joint Participants

United States Marine Corps; United States Navy; United States Special Operations Command; United States Air Force

Responsible Office

Col Matthew Kelly	Phone:	301-757-5161
PMA-275 (V-22 Osprey Joint Services Advanced Vertical	Fax:	301-757-7558
Lift Aircraft (V-22)) Program Executive Office - Air, Anti-Submarine Warfare	DSN Phone:	757-5161
Assault & Special Mission Programs	DSN Fax:	757-7558
47123 Buse Road Bldg 2272 Patuxent River, MD 20670-1547	Date Assigned:	July 2, 2017

matthew.g.kelly@navy.mil

References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated September 28, 2005

Approved APB

Air Force Acquisition Executive (AFAE) Approved Acquisition Program Baseline (APB) dated December 17, 2018

Mission and Description

The V-22 Osprey Joint Services Advanced Vertical Lift Aircraft (V-22) Program was established by the DoD to develop, test, evaluate, procure, field and support a tilt rotor, Vertical/Short Takeoff and Landing aircraft for Joint Service application. The Navy was designated the Executive Agent with support from the United States Air Force (USAF) in the V-22 Joint Program Office located at the Naval Air Systems Command Headquarters, Naval Air Station Patuxent River, MD. The V-22 Program is designed to provide an aircraft to meet the amphibious/vertical assault needs of the United States Marine Corps (USMC), the Carrier-On Board Delivery/fleet logistics needs of the Navy, and the special operations needs of the USAF and United States Special Operations Command (USSOCOM). The MV-22 variant replaces the CH-46E and CH-53D in the USMC. The CV-22 variant replaces the MH-53-J/M, but also provides a new capability and augments the MC-130 in the USAF/USSOCOM inventory for special operations infiltration, exfiltration, and resupply missions. The Navy CMV-22 will be replacing the C-2A in the Navy inventory. The V-22 is capable of flying over 2,100 nautical miles with a single refueling, giving the Services the advantage of a Vertical/Short Takeoff and Landing aircraft able to rapidly self-deploy to any location in the world.

Block Descriptions: V-22 capability is being increased and fielded over time via a Block upgrade acquisition strategy. MV-22 Block A provides a "Safe and Operational Test and Training Asset" configuration that supports developmental and operational flight tests, as well as fleet training. MV-22 Block B provides for correction of previously identified deficiencies and suitability improvements. MV-22 Block C provides mission enhancements and continued Reliability and Maintainability (R&M) improvements. Block 0/10 is a CV-unique configuration including radar and electronic countermeasures upgrades. Block 20 provides an enhanced CV-unique configuration with communications and aircraft system performance upgrades and continued R&M improvements. The Navy CMV-22 is an MV-22 Block C configuration with enhancements including extended range fuel tanks, high frequency radio and a cabin intercom system.

Threshold Breaches

APB Breach	les	
Schedule		
Performanc	e	
Cost	RDT&E	
	Procurement	
	MILCON	
	Acq O&M	
O&S Cost	1.12.1.1.1.1	
Unit Cost	PAUC	
	APUC	
Nunn-McCu	rdy Breaches	
Current UC	R Baseline	
	PAUC	None
	APUC	None
Original UC	R Baseline	
	PAUC	None
	APUC	None

Schedule



-

GSD CMV-22B IOC

Schedule Events									
Events	SAR Baseline Production Estimate	Curre Prod Objective	Current Estimate						
Milestone 0 (DEPSECDEF MEMO)	Dec 1981	Dec 1981	Jun 1982	Dec 1981					
Milestone I (DSARC I)	Dec 1982	Dec 1982	Jun 1983	Dec 1982					
Preliminary Design Contract Award	Apr 1993	Apr 1993	Oct 1993	Apr 1983					
Milestone II (DSARC II)	Apr 1986	Apr 1986	Oct 1986	Apr 1986					
FSD Contract Award	May 1986	May 1986	Nov 1986	May 1986					
Production Contract Award (Long Lead AAC)	Jan 1989	Jan 1989	Jul 1989	Mar 1989					
EMD Airframe Contract Award	Oct 1992	Oct 1992	Apr 1993	Oct 1992					
EMD Engine Contract Award	Dec 1992	Dec 1992	Jun 1993	Dec 1992					
SRR Complete	Aug 1993	Aug 1993	Feb 1994	Aug 1993					
PDR Complete	Apr 1994	Apr 1994	Oct 1994	Apr 1994					
MS II Plus Program Review	Sep 1994	Sep 1994	Mar 1995	Sep 1994					
CDR Complete	Dec 1994	Dec 1994	Jun 1995	Dec 1994					
Modification to EMD Contract to Include CV-22 Efforts	Aug 1995	Aug 1995	Feb 1996	Aug 1995					
LRIP 1 Contract Award (Long lead \$)	Jun 1996	Jun 1996	Dec 1996	Jun 1996					
CV-22 SRR	Aug 1996	Aug 1996	Feb 1997	Aug 1996					
DAB LRIP REVIEW	Apr 1997	Apr 1997	Oct 1997	Apr 1997					
LRIP 2 Contract Award (Long lead \$)	Apr 1997	Apr 1997	Oct 1997	Apr 1997					
CV-22 PDR	Dec 1997	Dec 1997	Jun 1998	Dec 1997					
LRIP 3 Contract Award (Long Lead \$)	Feb 1998	Feb 1998	Aug 1998	Mar 1998					
CV-22 CDR	Dec 1998	Dec 1998	Jun 1999	Dec 1998					
LRIP 4 Contract Award (Long Lead \$)	Mar 1999	Mar 1999	Sep 1999	Mar 1999					
LRIP 1 First Delivery	May 1999	May 1999	Nov 1999	May 1999					
MV-22 TECHEVAL									
Start	Jul 1999	Jul 1999	Jan 2000	Jul 1999					
Complete	Sep 1999	Sep 1999	Mar 2000	Sep 1999					
MV-22 OPEVAL									
Start	Nov 1999	Nov 1999	May 2000	Nov 1999					
Complete	Jul 2000	Jul 2000	Jan 2001	Jul 2000					
PCA	Dec 1999	Dec 1999	Jun 2000	Dec 1999					
CV-22 Flight Test			1						
Start	Feb 2000	Feb 2000	Aug 2000	Feb 2000					
Complete	Oct 2007	Oct 2007	Apr 2008	Oct 2007					

LRIP 5 Contract Award (Long Lead \$)	Jun 2000	Jun 2000	Dec 2000	Jun 2000
LRIP 6 Contract Award (Long Lead \$)	Jun 2000	Jun 2000	Dec 2000	Jun 2000
CV-22 Production Contract Award (Long lead \$)	Jun 2000	Jun 2000	Dec 2000	Jun 2000
LRIP 2 First Delivery	Apr 2000	Apr 2000	Oct 2000	Jul 2000
LRIP 7 Contract Award (Long Lead \$)	Mar 2002	Mar 2002	Sep 2002	Mar 2002
LRIP 3 First Delivery	Apr 2003	Apr 2003	Oct 2003	Apr 2003
LRIP 8 Contract Award (Long Lead \$)	May 2003	May 2003	Nov 2003	May 2003
LRIP 4 First Delivery	Aug 2003	Aug 2003	Feb 2004	Aug 2003
LRIP 5 First Delivery	Oct 2003	Oct 2003	Apr 2004	Oct 2003
LRIP 6 First Delivery	Jan 2004	Jan 2004	Jul 2004	Jan 2004
LRIP 9 Contract Award (Long Lead \$)	Jan 2004	Jan 2004	Jul 2004	Feb 2004
MV-22 Operational Test-2F				
Start	May 2004	May 2004	Nov 2004	May 2004
Complete	Jul 2004	Jul 2004	Jan 2005	Jul 2004
Full Rate Production Contract Award (Long lead \$)	Jan 2005	Jan 2005	Jul 2005	Jan 2005
MV-22 OPEVAL Phase II				
Start	Nov 2004	Nov 2004	May 2005	Mar 2005
Complete	May 2005	May 2005	Nov 2005	Jun 2005
LRIP 7 First Delivery	Feb 2005	Feb 2005	Aug 2005	Apr 2005
CV-22 First PRTV Delivery	Jul 2005	Jul 2005	Jan 2006	Sep 2005
MS III	Oct 2005	Oct 2005	Apr 2006	Oct 2005
LRIP 8 First Delivery	Dec 2005	Dec 2005	Jun 2006	Dec 2005
CV-22 First Production Delivery	Feb 2006	Feb 2006	Aug 2006	Mar 2006
CV-22 IOT&E				
Start	Jun 2006	Jun 2006	Dec 2006	Jun 2006
Complete	Dec 2007	Dec 2007	Jun 2008	Jun 2008
LRIP 9 First Delivery	Nov 2006	Nov 2006	May 2007	Dec 2006
MV-22 IOC	Mar 2007	Mar 2007	Sep 2007	Jun 2007
CV IOC	Oct 2009	Oct 2009	Apr 2010	Mar 2009
GSD	Dec 2010	Dec 2010	Jun 2011	Apr 2010
CMV-22B IOC	N/A	Jun 2021	Dec 2021	Jun 2021

Change Explanations

None

Acronyms and Abbreviations

AAC - Advanced Acquisition Contract CDR - Critical Design Review DEPSECDEF - Deputy Secretary of Defense DSARC - Defense Systems Acquisition Review Council FSD - Full Scale Development GSD - Government Support Date IOT&E - Initial Operational Test and Evaluation MS - Milestone OPEVAL - Operational Evaluation PCA - Physical Configuration Audit PDR - Preliminary Design Review PRTV - Production Representative Test Vehicle SRR - System Requirements Review TECHEVAL - Technical Evaluation

Track to Budget

T&E				
Appn		BA	PE	
Navy	1319	05	0604262N	
	Pro	ject	Name	
	1425	1.00	V-22	and the second
	N	otes:	USMC MV-22 and USN Test activities	CMV-22 Development and
Air Force	3600	05	0401318F	
	Pro	ject	Name	
	65410)3	CV-22	(Sunk)
	N	otes:	USAF CV-22 Developm	ent and Test activities
Air Force	3600	07	0401318F	
	Pro	ject	Name	
	67603	13	CV-22 Post Production Support	
Defense-Wide	0400	07	1160403BB	
	Pro	ject	Name	
	SF20	0	CV-22 Development	(Shared)
	N	otes:	Special Operations Con Test activities	nmand Development and
Defense-Wide	0400	07	1160404BB	
	Pro	ject	Name	
	SF20	C	SO Tactical Systems (Automation)	(Sunk)
Defense-Wide	0400	07	1160421BB	
	Pro	ject	Name	
	SF20	D	CV-22	(Sunk)
ocurement				
Appn		BA	PE	
Navy	1506	01	0206121M	
	Line	Item	Name	
	0164		MV-22	
Navy	1506	01	0204151N	
	Line	Item	Name	
	0164		CMV-22	
Navy	1506	06	0206121M	
	Line	Item	Name	
	0605		Spares and Repair Par	ts (Shared)
Navy	1506	06	0204151N	

	Line	ltem	Name	
	0605		Spares and Repair Parts	(Shared)
Air Force	3010	06	0401318F	
	Line	Item	Name	100 m
	000999)	Initial Spares/Repair Parts	(Shared)
Air Force	3010	04	0401318F	
	Line	ltem	Name	
	V022A	0	CV-22 (MYP)	
Defense-Wide	0300	02	1160421BB	
	Line	tem	Name	
	1000C	V22	CV-22 Modification	(Shared)

MILCON

Appn		BA	PE	
Navy	1205	01	0203176N	
	Pro	ject	Name	
	024610 62688	018 102	CMV-22B Airfield Improvements Hangar and Airfield Improvements CMV-22B	s for
Navy	1205	01	0216496M	
	Pro	ject	Name	
	003188	887	LHD Pad Conversion and MV-22 Improvements	Z (Sunk)
Navy	1205	01	0712876N	
	Pro	ject	Name	
	02461	024	CMV-22B Maintenance Hangar	
Navy	1205	01	0901211N	
	Pro	ject	Name	
	644820	044	Design Funds for CMV-22B MILC Funding for Naval Base Coronado	ON (Shared) (Sunk)
Defense-Wide	0500	01	1140494BB	
	Pro	ject	Name	
	AFSO	C103	Special Operations Command Si Facility	mulator (Sunk)

Cost and Funding

Cost Summary

Total Acquisition Cost											
	B	Y 2005 \$M		BY 2005 \$M	TY \$M						
Appropriation	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate				
RDT&E	11446.5	12759.7	14035.7	12886.3	9891.7	11552.1	11736.5				
Procurement	38562.8	38853.9	42739.3	38105.0	43099.3	44495.7	43457.0				
Flyaway				31160.8			35784.8				
Recurring			· · ·	29613.7	() 122		34095.8				
Non Recurring				1547.1			1689.0				
Support		S	++	6944.2	·		7672.2				
Other Support				5290.9			5907.2				
Initial Spares	++	441		1653.3	44		1765.0				
MILCON	241.1	407.8	448.6	370.3	262.4	539.1	494.5				
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total	50250.4	52021.4	N/A	51361.6	53253.4	56586.9	55688.0				

Current APB Cost Estimate Reference

Based on PB FY 2019 and POE for additional required CV-22 aircraft dated February 13, 2018

Cost Notes

No cost estimate for the program has been completed in the previous year.

Total Quantity								
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate					
RDT&E	2	2	2					
Procurement	456	462	462					
Total	458	464	464					

Cost and Funding

Funding Summary

			App	ropriation S	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	10778.2	237.2	153.7	127.1	167.9	173.7	61.8	36.9	11736.5
Procurement	38640.3	1266.1	984.3	1262.4	82.6	123.7	0.0	1097.6	43457.0
MILCON	236.2	86.8	1.6	80.8	75.8	1.0	12.3	0.0	494.5
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2021 Total	49654.7	1590.1	1139.6	1470.3	326.3	298.4	74.1	1134.5	55688.0
PB 2020 Total	49663.3	1314.2	1143.3	1316.2	1074.1	488.2	596.7	104.2	55700.2
Delta	-8.6	275.9	-3.7	154.1	-747.8	-189.8	-522.6	1030.3	-12.2

			Qu	antity Su	mmary					
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	2	0	0	0	0	0	0	0	0	2
Production	0	418	14	9	13	1	1	0	6	462
PB 2021 Total	2	418	14	9	13	1	1	0	6	464
PB 2020 Total	2	418	10	9	11	8	2	4	0	464
Delta	0	0	4	0	2	-7	-1	-4	6	0

Cost and Funding

Annual Funding By Appropriation

	13	19 RDT&E Res	Annual Fu search, Developr	inding nent, Test, and I	Evaluation, N	avy	
				TY \$M			
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1982		**		-	-		0.7
1983							34.4
1984							83.1
1985							169.5
1986							525.1
1987				÷+			421.7
1988		**					404.8
1989					-		269.9
1990							204.2
1991							212.2
1992							758.0
1993							713.3
1994							8.7
1995							451.8
1996							716.4
1997							605.5
1998							487.5
1999							335.8
2000							175.9
2001							217.9
2002							391.6
2003				-	+		387.4
2004							357.3
2005							246.9
2006							192.2
2007							251.6
2008							118.0
2009					-		65.7
2010							76.9
2011							40.3
2012							69.1
2013							44.0
2014							40.6
2015							49.7
2016	120						74.4

2017	 					149.1
2018	 					177.0
2019	 					131.4
2020	 					191.2
2021	 					118.5
2022	 				-11	100.1
2023	 ÷.		++			132.6
2024	 					137.6
2025	 					27.1
2026	 	144		1		26.2
2027	 					10.7
Subtotal	 			.11		10403.6

Fiscal Year Quantity End Item Recurring Flyaway Non End Item Recurring Flyaway Non Recurring Flyaway Total Flyaway Total Support 1982 1983 1984 1985 1986 1986 1987 1988 1989 1989 1991 </th <th>Total Program 1.2 56.7 132.1 261.3 786.9 613.8 570.1 364.7 265.1 266.0</th>	Total Program 1.2 56.7 132.1 261.3 786.9 613.8 570.1 364.7 265.1 266.0
Fiscal Year Quantity End Item Recurring Flyaway Non End Item Recurring Flyaway Non Recurring Flyaway Total Flyaway Total Support 1982 1983 1984 1985 1986 1987 1988 1989 1989 1990 1991 </th <th>Total Program 1.2 56.7 132.1 261.3 786.9 613.8 570.1 364.7 265.1 266.0</th>	Total Program 1.2 56.7 132.1 261.3 786.9 613.8 570.1 364.7 265.1 266.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.2 56.7 132.1 261.3 786.9 613.8 570.1 364.7 265.1 266.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	56.7 132.1 261.3 786.9 613.8 570.1 364.7 265.1 266.0
1984 <	132.1 261.3 786.9 613.8 570.1 364.7 265.1 266.0
1985 <	261.3 786.9 613.8 570.1 364.7 265.1 266.0
1986 <	786.9 613.8 570.1 364.7 265.1 266.0
1987 <	613.8 570.1 364.7 265.1 266.0
1988 <	570.1 364.7 265.1 266.0
1989 <	364.7 265.1 266.0
1990 <	265.1
1991 <	266.0
1992 <	200.0
1993 1994 1995 1996	923.2
1994 1995 1996	849.1
1995 1996	10.2
1996	517.9
	807.6
1997	674.3
1998	538.5
1999	366.6
2000	189.3
2001	231.3
2002	411.5
2003	401.2
2004	. 360.0
2005	242.4
2006	183.0
2007	233.8
2008	. 107.7
2009	. 59.2
2010	. 68.3
2011	. 34.9
2012	58.9
2013	37.1
2014	33.8
2015	40.8
2016	60.1
2017	118.2
2018	137.1
2019	99.8
2020	142.4
2021	86.5

LINIOL LOOIELED VEOD	OFFICIAL	LOE	OLU V
UNULAUUIT ILD/IT UT	OTTIOIAL	OOL	UNLT

1	1-	2	2
		_	_

Subtotal	 	2-4	 		11644.4
2027	 		 	÷.	6.9
2026	 		 		17.3
2025	 		 		18.3
2024	 		 		94.7
2023	 		 		93.0
2022	 		 		71.6

	3600	RDT&E Resea	Annual Fu arch, Developme	inding ent, Test, and Ev	aluation, Air	Force	
				TY \$M			
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1985							0.8
1986							2.3
1987				-			3.0
1988				**			
1989							
1990				+			
1991							
1992		÷					
1993			. 22				
1994							
1995							
1996							
1997							
1998							
1999							
2000	-						
2001							
2002							145.5
2003							5.9
2004							52.7
2005							14.2
2006							30.5
2007							12.8
2008							22.0
2009				++			16.1
2010							15.5
2011	÷+-						17.6
2012							9.6
2013		44		++			19.7
2014			22				44.9
2015							37.7
2016							26.8
2017							28.7
2018		++			÷+-		17.7
2019							16.0
2020							17.9
2021							18.4
2022							17.4
2023							17.4
2024							17.7
2021							

2025		 		 	16.0
Subtotal	2	 	144	 	644.8

	3600	RDT&E Resea	Annual Fu arch, Developme	inding ent, Test, and Ev	aluation, Air I	Force	
				BY 2005 \$	M		1
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1985				-			1.2
1986							3.5
1987							4.3
1988				**	**		÷+-
1989							
1990						÷÷	
1991							
1992		**		÷*	**	17	
1993							
1994				-			
1995							
1996							
1997			÷+	-	+		
1998		**					
1999					-		
2000		-			-		
2001							
2002							153.0
2003		÷-			~		6.1
2004							53.3
2005					-		14.0
2006							29.2
2007					**		11.9
2008							20.1
2009		÷÷		**			14.5
2010							13.8
2011	÷			**			15.4
2012							8.3
2013		+					16.7
2014							37.4
2015							31.1
2016							21.8
2017							22.9
2018		**			++		13.8
2019					-		12.3
2020							13.4
2021							13.5
2022							12.6
2023			()				12.3
2024		77		**	#		12.3

2025		 		1.42	 10.9
Subtotal	2	 	144		 579.6

The FY 2002 Appropriation Act provided funding for two CV-22 Production Representative Test Vehicles.

	0400 F	RDT&E Researc	Annual Fu ch, Development	Inding , Test, and Evalu	uation, Defen	se-Wide	
				TY \$M			
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1990						(46)	36.1
1991							8.0
1992							15.0
1993	0						
1994							14.7
1995							
1996							
1997	1						
1998							
1999				-			
2000			42	-			33.5
2001							40.1
2002			(44)		-		104.1
2003							32.2
2004							68.4
2005							53.1
2006							23.7
2007							
2008							21.9
2009							30.5
2010							12.2
2011							14.0
2012		÷7			÷.		10.8
2013							2.1
2014	÷.			**			2.8
2015							0.2
2016					-		
2017							15.6
2018		-		÷-			12.3
2019							27.3
2020		-			4		28.1
2021	÷-			÷			16.8
2022	1.000				÷.		9.6
2023	1. A.			(**	+		17.9
2024							18.4
2025				-			18.7
Subtotal							688.1

	0400 F	RDT&E Researc	Annual Fu	unding , Test, and Eval	uation, Defen	se-Wide		
i		BY 2005 \$M						
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
1990							46.9	
1991							10.0	
1992							18.2	
1993	()							
1994							17.2	
1995				-				
1996								
1997	1 0 49							
1998								
1999								
2000							36.0	
2001							42.5	
2002	· · · · ·			-	-		109.3	
2003							33.3	
2004				-			69.1	
2005							52.1	
2006							22.6	
2007								
2008					-		20.0	
2009							27.5	
2010					-		10.8	
2011					-		12.2	
2012							9.3	
2013							1.8	
2014	**			++			2.3	
2015							0.2	
2016								
2017							12.4	
2018		-					9.6	
2019			12.2				20.8	
2020							21.0	
2021							12.3	
2022							6.9	
2023		**		/++	++		12.6	
2024							12.7	
2025				-	-		12.7	
Subtotal							662.3	

		1506 Pro	Annual Fu ocurement Aircr	unding aft Procurement	, Navy		
	TY \$M						
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1989						231.4	231.4
1990							
1991				-			
1992				**			
1993							
1994	÷			+			
1995							
1996		41.1			41.1		41.1
1997	5	552.1		25.0	577.1	132.2	709.3
1998	7	622.1		20.4	642.5	66.2	708.7
1999	7	561.4		18.0	579.4	104.1	683.5
2000	11	768.4		31.0	799.4	187.8	987.2
2001	9	753.1		99.2	852.3	157.9	1010.2
2002	9	660.6		21.6	682.2	204.6	886.8
2003	11	844.2		109.4	953.6	129.6	1083.2
2004	9	651.9		59.9	711.8	167.5	879.3
2005	8	584.4		115.8	700.2	321.8	1022.0
2006	12	868.2		146.4	1014.6	367.1	1381.7
2007	14	1129.2		222.8	1352.0	244.3	1596.3
2008	23	1651.9		153.8	1805.7	308.1	2113.8
2009	30	1855.8		70.6	1926.4	307.8	2234.2
2010	30	1847.9		81.6	1929.5	317.4	2246.9
2011	30	1855.6		30.5	1886.1	264.7	2150.8
2012	30	1921.3		25.8	1947.1	264.3	2211.4
2013	18	1289.9		27.4	1317.3	165.8	1483.1
2014	19	1219.2		35.9	1255.1	157.0	1412.1
2015	19	1332.5		19.2	1351.7	196.0	1547.7
2016	19	1342.8		0.3	1343.1	97.6	1440.7
2017	19	1374.7		-	1374.7	122.5	1497.2
2018	14	1076.3		7.6	1083.9	189.7	1273.6
2019	13	1024.6		7.7	1032.3	134.7	1167.0
2020	14	1124.8	49	5.0	1129.8	136.3	1266.1
2021	9	773.2		23.1	796.3	181.4	977.7
2022	13	1063.8		15.7	1079.5	172.0	1251.5
2023	1	75.3			75.3	3.8	79.1
2024	1	122.8	(**	0.9	123.7		123.7
2025							
2026	4	510.9		104.3	615.2	96.5	711.7
Subtotal	408	29500.0	1	1478.9	30978.9	5430.1	36409.0

Annual Funding 1506 Procurement Aircraft Procurement, Navy							
				BY 2005 \$M			
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1989						299.8	299.8
1990							
1991				-			
1992				**			
1993							
1994	÷			+			
1995							
1996		45.8			45.8		45.8
1997	5	609.6		27.6	637.2	146.0	783.2
1998	7	679.0		22.3	701.3	72.3	773.6
1999	7	605.0		19.4	624.4	112.2	736.6
2000	11	817.2		33.0	850.2	199.8	1050.0
2001	9	791.5		104.3	895.8	166.0	1061.8
2002	9	685.6		22.4	708.0	212.4	920.4
2003	11	859.1		111.3	970.4	131.9	1102.3
2004	9	646.3		59.4	705.7	166.1	871.8
2005	8	563.5		111.7	675.2	310.3	985.5
2006	12	814.6		137.4	952.0	344.4	1296.4
2007	14	1035.3		204.3	1239.6	224.0	1463.6
2008	23	1492.2		138.9	1631.1	278.3	1909.4
2009	30	1653.4		62.9	1716.3	274.2	1990.5
2010	30	1612.6		71.2	1683.8	277.0	1960.8
2011	30	1587.8		26.1	1613.9	226.5	1840.4
2012	30	1620.7		21.8	1642.5	222.9	1865.4
2013	18	1076.5		22.9	1099.4	138.3	1237.7
2014	19	1004.4		29.6	1034.0	129.3	1163.3
2015	19	1081.4		15.6	1097.0	159.1	1256.1
2016	19	1067.8		0.2	1068.0	77.7	1145.7
2017	19	1071.9			1071.9	95.5	1167.4
2018	14	824.0	22	5.8	829.8	145.2	975.0
2019	13	769.1		5.8	774.9	101.1	876.0
2020	14	827.8	(44)	3.7	831.5	100.3	931.8
2021	9	557.9	/	16.7	574.6	130.8	705.4
2022	13	752.5		11.1	763.6	121.7	885.3
2023	1	52.2			52.2	2.7	54.9
2024	1	83.5		0.6	84.1		84.1
2025				-			
2026	4	333.9		68.1	402.0	63.1	465.1
Subtotal	408	25622.1		1354.1	26976.2	4928.9	31905.1

Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2005 \$M
1989	-	
1990	-	
1991	5	
1992	-	
1993		-
1994		
1995		-
1007	5	502 7
1997	7	675 0
1990	7	612.9
2000	11	800.2
2000	9	791 6
2002	9	722 8
2003	11	834.8
2004	9	670.4
2005	8	549.7
2006	12	803.9
2007	14	921.0
2008	23	1488.9
2009	30	1757.0
2010	30	1617.7
2011	30	1593.0
2012	30	1634.4
2013	18	1018.6
2014	19	1078.6
2015	19	1075.5
2016	19	1076.2
2017	19	1090.0
2018	14	821.4
2019	13	765.5
2020	14	830.2
2021	9	548.5
2022	13	778.2
2023	1	52.4
2024	1	86.0
2025		
2026	4	333.9
Subtotal	408	25622.1

	Annual Funding 3010 Procurement Aircraft Procurement, Air Force								
		TY \$M							
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program		
1999				-		21.9	21.9		
2000				19.5	19.5	21.3	40.8		
2001				26.7	26.7	22.5	49.2		
2002									
2003		9.8			9.8	79.1	88.9		
2004	2	147.6			147.6	42.0	189.6		
2005	3	209.1		7.2	216.3	113.9	330.2		
2006	2	136.6		18.6	155.2	94.1	249.3		
2007	3	219.6		9.3	228.9	156.2	385.1		
2008	10	659.4		7.0	666.4	272.4	938.8		
2009	6	359.6	122	16.4	376.0	103.4	479.4		
2010	5	314.3		18.8	333.1	238.0	571.1		
2011	6	388.9	(44)	15.0	403.9	166.3	570.2		
2012	5	332.1		4.0	336.1	62.6	398.7		
2013	4	255.0		0.5	255.5	61.8	317.3		
2014	4	258.2		3.2	261.4	36.0	297.4		
2015				15.0	15.0	3.7	18.7		
2016	1	64.5		0.1	64.6	7.8	72.4		
2017	1	97.0		÷-	97.0	0.9	97.9		
2018						0.2	0.2		
2019					-				
2020						-			
2021						6.6	6.6		
2022						10.9	10.9		
2023						3.5	3.5		
2024									
2025									
2026	2	291.0			291.0	94.9	385.9		
Subtotal	54	3742.7		161.3	3904.0	1620.0	5524.0		

		3010 Proc	Annual Fu urement Aircraf	unding t Procurement. A	Air Force				
		BY 2005 \$M							
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program		
1999				14	يد	23.6	23.6		
2000				20.7	20.7	22.6	43.3		
2001				28.0	28.0	23.7	51.7		
2002									
2003		10.0			10.0	80.9	90.9		
2004	2	147.0			147.0	41.8	188.8		
2005	3	202.3		7.0	209.3	110.2	319.5		
2006	2	128.7		17.5	146.2	88.8	235.0		
2007	3	201.6		8.5	210.1	143.4	353.5		
2008	10	595.8		6.3	602.1	246.2	848.3		
2009	6	319.5	- 2.2	14.6	334.1	91.8	425.9		
2010	5	274.0		16.4	290.4	207.5	497.9		
2011	6	333.7		12.9	346.6	142.6	489.2		
2012	5	280.7		3.4	284.1	52.9	337.0		
2013	4	211.2		0.4	211.6	51.2	262.8		
2014	4	210.8		2.6	213.4	29.4	242.8		
2015		-		12.1	12.1	3.0	15.1		
2016	1	51.0		0.1	51.1	6.1	57.2		
2017	1	75.2			75.2	0.7	75.9		
2018		-				0.2	0.2		
2019									
2020									
2021						4.7	4.7		
2022						7.6	7.6		
2023						2.4	2.4		
2024									
2025									
2026	2	188.4			188.4	61.4	249.8		
Subtotal	54	3229.9		150.5	3380.4	1442.7	4823.1		

3010 Procuremen	nt Aircraft Procure	ment, Air Force
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2005 \$M
1999		-
2000		
2001		-
2002		-
2003		-
2004	2	142.0
2005	3	206.0
2006	2	130.3
2007	3	185.
2008	10	584.
2009	6	343.
2010	5	274.
2011	6	334.
2012	5	275.
2013	4	215.
2014	4	223.
2015		
2016	1	51.
2017	1	75.
2018		
2019		-
2020		-
2021		
2022		-
2023		
2024		-
2025		-
2026	2	188.
Subtotal	54	3229.9

		0300 Pro	Annual Fu curement Procu	inding irement, Defens	e-Wide			
	in the second	TY \$M						
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
1999			(***)			4.0	4.0	
2000						2.0	2.0	
2001						6.8	6.0	
2002						15.9	15.9	
2003		5.0			5.0	36.9	41.9	
2004		41.9			41.9	35.5	77.4	
2005		54.5		0.2	54.7	58.6	113.3	
2006		40.7		1.9	42.6	55.0	97.0	
2007		113.9			113.9	79.9	193.0	
2008		177.5		2.1	179.6	138.7	318.3	
2009		85.4		11.6	97.0	29.7	126.	
2010		56.1		7.1	63.2	31.7	94.9	
2011	-	57.3		9.1	66.4	37.2	103.6	
2012	-	57.1		8.5	65.6	34.0	99.6	
2013		59.1	2.00	3.8	62.9	30.3	93.3	
2014		61.6		4.5	66.1	25.9	92.0	
2015					-		-	
2016		18.0			18.0		18.0	
2017		25.0		-	25.0		25.0	
Subtotal		853.1		48.8	901.9	622.1	1524.0	

		0300 Pro	Annual Fu curement Procu	unding urement, Defens	e-Wide				
		BY 2005 \$M							
Fiscal Year	Quantity	End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program		
1999		**		.4		4.3	4.3		
2000					-	2.1	2.1		
2001						7.2	7.2		
2002						16.5	16.5		
2003		5.1			5.1	37.6	42.7		
2004		41.5			41.5	35.2	76.7		
2005		52.5		0.2	52.7	56.5	109.2		
2006		38.2		1.8	40.0	51.7	91.7		
2007		104.8			104.8	73.6	178.4		
2008		160.9		1.9	162.8	125.6	288.4		
2009		76.4		10.4	86.8	26.5	113.3		
2010		49.3		6.2	55.5	27.9	83.4		
2011	-	49.6		7.9	57.5	32.1	89.6		
2012		48.6		7.2	55.8	28.9	84.7		
2013		49.7		3.2	52.9	25.4	78.3		
2014	-	51.1		3.7	54.8	21.5	76.3		
2015				-			-		
2016		14.4			14.4		14.4		
2017		19.6			19.6		19.6		
Subtotal		761.7		42.5	804.2	572.6	1376.8		

Cost 0300 Procureme	Quantity Information	on Defense-Wide
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2005 \$M
1999		-
2000		
2001		-
2002		
2003		
2004	-	40.0
2005		56.4
2006		38.2
2007		46.2
2008	**	215.0
2009	-	79.6
2010		49.4
2011		49.7
2012		49.9
2013	-	50.3
2014		53.0
2015		-
2016		14.4
2017		19.6
Subtotal		761.7

1205 MILCON Military Cons Corp	struction, Navy and Marine
Finant	TY \$M
Year	Total Program
2003	0.8
2004	10.9
2005	14.5
2006	22.4
2007	
2008	
2009	-
2010	7.2
2011	-
2012	6.2
2013	-
2014	
2015	-
2016	-
2017	
2018	26.6
2019	77.8
2020	86.8
2021	1.6
2022	80.8
2023	75.8
2024	1.0
2025	12.3
Subtotal	424.7

Fiend	BY 2005 \$M
Year	Total Program
2003	0.8
2004	10.8
2005	13.9
2006	21.0
2007	
2008	
2009	**
2010	6.2
2011	
2012	5.2
2013	
2014	
2015	
2016	
2017	
2018	19.8
2019	56.7
2020	62.0
2021	1.1
2022	55.5
2023	51.0
2024	0.7
2025	8.0
Subtotal	312.7

Annual Fur 0500 MILCON Military Cons	iding struction, Defense-Wide
Fiend	TY \$M
Year	Total Program
2000	0.2
2001	0.3
2002	8.
2003	1.9
2004	-
2005	
2006	1.
2007	1.3
2008	0.
2009	8.
2010	
2011	
2012	6.
2013	
2014	4
2015	
2016	4
2017	6.:
2018	33.
Subtotal	69.1

Annual 0500 MILCON Military 0	Funding Construction, Defense-Wide
Finand	BY 2005 \$M
Year	Total Program
2000	0.2
2001	0.3
2002	8.8
2003	1.9
2004	
2005	
2006	1.7
2007	1.7
2008	0.6
2009	7.3
2010	
2011	
2012	5.3
2013	
2014	
2015	
2016	
2017	4.8
2018	25.0
Subtotal	57.6

Charts





Program Acquisition Cost - V-22 Base Year 2005 \$M



Quantity - V-22



The Unit Cost fluctuations between 2001 and 2003 are due to the program restructure based on the recommendations of the Blue Ribbon Panel which was convened after the grounding of the V-22 Fleet and delay of the Full Rate Production decision. The restructure resulted in a significant Nunn-McCurdy Unit Cost Breach from reduced quantities, increases in overhead and labor rates, flattened learning curves, and schedule and scope growth in the development program. Following this breach, a new APB was approved.

The Unit Cost percentage fluctuations between 2005 and 2007 are due to a new APB for the approved Production Baseline, which included updated total acquisition costs and a baseline shift from Base Year (BY) 1986 to BY 2005. Pursuant to FY 2006 National Defense Authorization Act, changes to Section 2433, Title 10, United States Code, the Original UCR Baseline (BY 1986) was revised to the Current UCR Baseline (BY 2005) because the unit cost exceeded 50 percent.

Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks Current Estimate (December 2019)

1. The V-22 Program is over 80% complete and there are currently no significant schedule or technical risks to report.

Risks

Risk and Sensitivity Analysis

	Risks and Sensitivity Analysis
	Current Baseline Estimate (December 2018)
1.	There are currently 14 Program of Record (POR) aircraft remaining outside the FY 2018FY 2022 Multi- Year Procurement (MYP3) Contract. There is a risk with increased cost of the aircraft under a single year production contract.
	Original Baseline Estimate (February 1988)
1.	The Original V-22 Development Baseline was established in February 1988 with a planned total procurement quantity of 682 aircraft for the Navy/Marine Corps, Army and Air Force. The V-22 was the first of type tilt rotor aircraft with a very high technical risk, which impacted both cost and schedule. After numerous technical challenges in development which impacted the affordability of the aircraft, the Army withdrew from the program and the program was rebaselined.
	Revised Original Estimate (September 2005)
1.	Per the V-22 Milestone III Navy Center for Cost Analysis (NCCA) Independent Cost Estimate (ICE), the MV 22 Procurement cost estimate for 360 aircraft was 6% higher, and the CV-22 procurement cost estimate for 50 aircraft is 6% higher, than the Program Office Estimate (POE). A revised APB was signed June 9, 2006 which reduced the program estimate due to this analysis.
	Current Procurement Cost (December 2019)
1.	Current production is on schedule and within budget. The program has been funded to the service cost estimate based on the latest actual costs and Multi-Year Procurement (MYP) contract value.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP			
Approval Date	4/25/1997	5/6/2002			
Approved Quantity	25	58			
Reference	LRIP ADM	Program Restructure ADM			
Start Year	1997	1997			
End Year	2001	2009			

The Current Total LRIP Quantity is more than 10% of the total production quantity due to a program restructure with the May 2002 ADM which authorized additional LRIP aircraft. Lots 1-9 were LRIP aircraft.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
Japan	8/9/2019		196.5	FMS Case JA-P-QDR: Procurement of aircraft spares, support equipment, training and initial sustainment support for 17 V-22 aircraft.
Japan	8/8/2018	4	645.0	FMS Case JA-P-SCP: Procurement of continued Phase III Non-Recurring Engineering, four V-22 aircraft, training, and associated logistics support.
Japan	8/8/2017	4	655.2	FMS Case JA-P-SCO: Procurement of, four (4) V -22 aircraft, long lead components for four (4) additional aircraft, Non-Recurring Engineering and associated logistics support.
Japan	6/9/2016	4	661.1	FMS Case JA-P-SCS: Procurement of four V-22 aircraft, completion of Non-Recurring Engineering test and integration of Japan communication equipment into the MV-22 aircraft and MV- 22 Containerized Flight Training Device.
Japan	6/12/2015	5	556.0	FMS Case JA-P-SCH: Procurement of five (5) V- 22 aircraft, Non-Recurring Engineering for integration of unique Japan communications equipment, and associated logistics support.
Japan	8/22/2014		1.0	FMS Case JA-P-FXQ: Studies and Analysis of the V-22 Program to refine requirements for future aircraft procurement and conduct site assessments in Japan.
Israel	11/21/2013		1.3	FMS Case IS-P-GOY-A1: Studies and Analysis of the V-22 Program to refine requirements for future aircraft procurement and conduct site assessments in Israel.

Notes

Nuclear Costs

None

Unit Cost

Current UCR Base	eline and Current Estimate	(Base-Year Dollars)		
	BY 2005 \$M	BY 2005 \$M		
Item	Current UCR Baseline (Dec 2018 APB)	Current Estimate (Dec 2019 SAR)	% Change	
Program Acquisition Unit Cost				
Cost	52021.4	51361.6		
Quantity	464	464		
Unit Cost	112.115	110.693	-1.27	
Average Procurement Unit Cost				
Cost	38853.9	38105.0		
Quantity	462	462		
Unit Cost	84.099	82.478	-1.93	
Original UCR Base	eline and Current Estimate	(Base-Year Dollars)		
	BY 2005 \$M	BY 2005 \$M		
Item	Revised Original UCR Baseline (Sep 2005 APB)	Current Estimate (Dec 2019 SAR)	% Change	
Program Acquisition Unit Cost				
Cost	50250.4	51361.6		
Quantity	458	464		
Unit Cost	109.717	110.693	+0.89	
Average Procurement Unit Cost				
Cost	38562.8	38105.0		
Quantity	456	462		
Unit Cost	84.568	82.478	-2.47	



APB Unit Cost History										
li entre	Data	BY 2005	\$M	TY \$M						
item	Date	PAUC	APUC	PAUC	APUC					
Original APB	Feb 1988	41.101	35.309	34.657	30.541					
APB as of January 2006	Sep 2005	109.717	84.568	116.274	94.516					
Revised Original APB	Sep 2005	109.717	84.568	116.274	94.516					
Prior APB	Oct 2011	109.717	84.568	116.274	94.516					
Current APB	Dec 2018	112.115	84.099	121.955	96.311					
Prior Annual SAR	Dec 2018	110.716	82.742	120.044	94.454					
Current Estimate	Dec 2019	110.693	82.478	120.017	94.063					

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)										
Initial PAUC Development Estimate	Changes								PAUC	
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Estimate	
40.180	-12.793	50.391	-4.762	8.157	30.121	0.000	4.980	76.094	116.274	

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes						PAUC		
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Estimate
116.274	-1.052	-0.264	4.672	3.038	-2.936	0.000	0.285	3.743	120.017

V-22

December 2019 SAR

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Estimate
36.641	-12.349	47.964	-4.862	5.134	16.986	0.000	5.002	57.875	94.516

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate		Changes					APUC		
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	Estimate
94.516	-1.078	0.017	4.692	0.468	-4.839	0.000	0.287	-0.453	94.063

SAR Baseline History										
ltem	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate						
Milestone I	Dec 1982	Dec 1982	Dec 1982	Dec 1982						
Milestone II	May 1985	Apr 1986	Apr 1986	Apr 1986						
Milestone III	Jul 1989	N/A	Oct 2005	Oct 2005						
IOC	Dec 1991	N/A	Mar 2007	Jun 2007						
Total Cost (TY \$M)	24467.0	29662.3	53253.4	55688.0						
Total Quantity	609	919	458	464						
PAUC	40.176	32.277	116.274	120.017						

Cost Variance

Summary TY \$M							
Item	RDT&E	Procurement	MILCON	Total			
SAR Baseline (Production Estimate)	9891.7	43099.3	262.4	53253.4			
Previous Changes							
Economic	+4.6	-478.8	+1.5	-472.7			
Quantity		+575.2		+575.2			
Schedule		+2222.7		+2222.7			
Engineering	+928.4	+216.1	+265.1	+1409.6			
Estimating	+854.8	-2245.6	-146.0	-1536.8			
Other							
Support		+248.8		+248.8			
Subtotal	+1787.8	+538.4	+120.6	+2446.8			
Current Changes							
Economic	+3.6	-19.4	+0.6	-15.2			
Quantity							
Schedule		-55.1		-55.1			
Engineering		-					
Estimating	+53.4	+10.2	+110.9	+174.5			
Other		1.1					
Support		-116.4		-116.4			
Subtotal	+57.0	-180.7	+111.5	-12.2			
Total Changes	+1844.8	+357.7	+232.1	+2434.6			
Current Estimate	11736.5	43457.0	494.5	55688.0			

	Summ	nary BY 2005 \$M		
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	11446.5	38562.8	241.1	50250.4
Previous Changes				
Economic				
Quantity		+420.4		+420.4
Schedule		+1169.3	-	+1169.3
Engineering	+696.7	+159.2	+190.8	+1046.7
Estimating	+706.8	-2186.7	-136.3	-1616.2
Other				
Support		+101.8		+101.8
Subtotal	+1403.5	-336.0	+54.5	+1122.0
Current Changes				
Economic				
Quantity				
Schedule		-36.2		-36.2
Engineering				
Estimating	+36.3	+5.5	+74.7	+116.5
Other				
Support	44	-91.1		-91.1
Subtotal	+36.3	-121.8	+74.7	-10.8
Total Changes	+1439.8	-457.8	+129.2	+1111.2
Current Estimate	12886.3	38105.0	370.3	51361.6

Previous Estimate: December 2018

RDT&E		ŞM		
Current Change Explanations	Base Year	Then Year		
Revised escalation indices. (Economic)	N/A	+3.6		
Revised estimate to account for Navy project reprioritization. (Navy) (Estimating)	+78.1	+111.0		
Revised estimate to realign funding to PU 3090: V-22 Improvement Program. (Navy) (Estimating)	-71.9	-101.3		
Revised estimate for FOT&E. (Air Force) (Estimating)	+10.2	+15.2		
Revised estimate for integration/testing of Block 20 Forward Defense Weapons System (FDWS) and Silent Knight Radar (SKR). (DoD) (Estimating)		+30.2		
Adjustment for current and prior escalation. (Estimating)	-1.4	-1.7		
RDT&E Subtotal	+36.3	+57.0		

Procurement	SM	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-19.4
Acceleration of procurement buy profile from FY2023 -FY2025 to FY2020 and FY2022 as well the stretch-out from FY2023 to FY2026. (Navy) (Schedule)	0.0	-10.9
Additional Schedule variance due to changes in the production buy profile. (Navy) (Schedule)	-32.1	-43.7
Stretch-out of procurement buy profile from FY2025 to FY2026. (Air Force) (Schedule)	0.0	+3.6
Reduction of Schedule variance due to changes in the production buy profile. (Air Force) (Schedule)	-4.1	-4.1
Adjustment for current and prior escalation. (Estimating)	+6.5	+8.5
Revised estimate for updated pricing on Airframe and Government Furnished Equipment. (Navy) (Estimating)	-0.3	+3.6
Revised estimate for Non-Recurring Engineering and Ancillary Equipment. (Navy) (Estimating)	-1.2	-2.8
Revised estimate to reflect actuals. (Air Force) (Estimating)	+0.5	+0.9
Adjustment for current and prior escalation. (Support)	+0.9	+1.2
Decrease in Other Support due to revised estimate of Support Equipment and Production Engineering Support. (Navy) (Support)	-155.5	-214.7
Increase in Initial Spares due to revised estimate. (Navy) (Support)	+1.8	+2.0
Increase in Production Engineering Support due to the stretch-out of the procurement buy profile to FY2026. (Air Force) (Support)	+58.0	+90.4
Increase in Initial Spares to reflect actuals. (Air Force) (Support)	+3.7	+4.7
Procurement Subtotal	-121.8	-180.7

MILCON	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+0.6
Revised estimate for CMV-22B Maintenance Hangar. (Navy) (Estimating)	+75.0	+111.4
Adjustment for current and prior escalation. (Estimating)	-0.3	-0.5

MILCON Subtotal

+74.7 +111.5

Contracts

Contract Identification		
Appropriation:	RDT&E	
Contract Name:	Navy Variant NRE	
Contractor:	Bell-Boeing	
Contractor Location:	401 Tiltrotor Drive Amarillo, TX 79111 N00019, 12 G, 0006/130	
Contract Type:	Cost Plus Fixed Fee (CPFF)	
Award Date:	March 31, 2016	
Definitization Date:	March 31, 2016	

				Contract Pr	ice		
Initial Cor	ntract Price ((\$M)	Current Co	ntract Price	(\$M)	Estimated Pric	e At Completion (\$M)
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
152.5	N/A	1	154.8	N/A	1	142.1	136.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional test wiring for CMV-22 Navy aircraft 1 and 2 and the addition of yearly drop tests.

	Contract Variance	
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/1/2019)	-5.2	-2.7
Previous Cumulative Variances	-0.7	-6.2
Net Change	-4.5	+3.5

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to a unplanned rework related to the fuel bladder interface control drawing.

The favorable net change in the schedule variance is due to early completion of wing fire protection efforts.

Contract Identification		
Appropriation:	RDT&E	
Contract Name:	GOJ Phase II	
Contractor:	Bell-Boeing JPO	
Contractor Location:	401 Tiltrotor Drive Amarillo, TX 79111	
Contract Number:	N00019-12-G-0006/112	
Contract Type:	Cost Plus Incentive Fee (CPIF)	
Award Date:	September 15, 2015	
Definitization Date:	September 15, 2015	

				Contract Pr	ice		
Initial Con	ntract Price (\$M)	Current Co	ntract Price	(\$M)	Estimated Pric	e At Completion (\$M)
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
20.9	N/A	N/A	204.5	N/A	N/A	166.5	170.9

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to incorporation of Non -Recurring Engineering for additional engineering changes for the Japan configuration of the V-22 aircraft.

Contract Variance						
Item	Cost Variance	Schedule Variance				
Cumulative Variances To Date (12/1/2019)	+14.1	-1.6				
Previous Cumulative Variances	+9.1	-5.7				
Net Change	+5.0	+4.1				

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to less engineering and level of effort support than originally budgeted.

The favorable net change in the schedule variance is due to to late engineering tasks being completed.

Contract Identification					
Appropriation:	Acq O&M				
Contract Name:	Mission Care Engine Sustainment (FY17-FY19)				
Contractor:	Rolls Royce Corporation				
Contractor Location:	2355 S. Tibbs Avenue Indianapolis, IN 46206				
Contract Number:	N00019-15-D-0019/1				
Contract Type:	Firm Fixed Price (FFP)				
Award Date:	December 20, 2016				
Definitization Date:	December 20, 2016				

				Contract Pr	ice		
Initial Contract Price (\$M)		Current Contract Price (\$M)		Estimated Price At Completion (\$M)			
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
407.8	N/A	N/A	449.0	N/A	N/A	449.0	449.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional Engine Flight Hours and Low Power Engine Repairs that were not included in the original contract award.

Cost and Schedule Variance Explanations

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

Notes

The V-22 Mission Care contract provides for sustainment of V-22 aircraft engines from FY 2017 through FY 2019. This is a Commercial Federal Acquisition Regulation Part 12 contract.

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

Contract Identification

Appropriation:	Procurement
Contract Name:	V-22 MYP2 YR 5 (FY17 Lot 21)
Contractor:	Bell-Boeing JPO
Contractor Location:	401 Tiltrotor Drive Amarillo, TX 79111
Contract Number:	N00019-12-C-2001/21
Contract Type:	Fixed Price Incentive(Firm Target) (FPIF)
Award Date:	December 15, 2016
Definitization Date:	December 15, 2016

Contract Price								
Initial Contract Price (\$M)		Current Contract Price (\$M)		Estimated Price At Completion (\$M)				
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager	
1210.0	1273.7	16	1841.1	1938.1	27	1474.6	1449.8	

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to incorporation of additional Variation In Quantity (VIQ) aircraft, supported by the approved budget, as well as, Engineering Change Proposals into the production line.

Contract Variance						
Item	Cost Variance	Schedule Variance				
Cumulative Variances To Date (12/1/2019)	-2.8	-37.5				
Previous Cumulative Variances	+18.8	-66.0				
Net Change	-21.6	+28.5				

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to raised material prices and late deliveries of parts.

The favorable net change in the schedule variance is due to recovery of late parts previously behind schedule.

Notes

An administrative change was required to reflect the corrected Initial Contract Price Target (from 1838.9 to 1210.0) and Ceiling (from 1935.9 to 1273.7), reported in the December 2017 SAR.

Contract Identification

Appropriation:	Procurement				
Contract Name:	V-22 MYP3 YR 1 (FY18 Lot 22)				
Contractor:	Bell-Boeing JPO				
Contractor Location:	401 Tiltrotor Drive Amarillo, TX 79111				
Contract Number:	N00019-17-C-0015/22				
Contract Type:	Fixed Price Incentive(Firm Target) (FPIF)				
Award Date:	June 29, 2018				
Definitization Date:	June 29, 2018				

Contract Price								
Initial Contract Price (\$M)		Current Contract Price (\$M)		Estimated Price At Completion (\$M)				
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager	
1401.9	1451.9	11	1327.7	1377.7	20	1236.0	1236.0	

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to incorporation of additional Variation in Quantity (VIQ) aircraft, supported by the approved budget, as well as, Engineering Change Proposals into the production line.

Contract Variance						
Item	Cost Variance	Schedule Variance				
Cumulative Variances To Date (12/1/2019)	-22.1	-57.1				
Previous Cumulative Variances	+1.9	-1.2				
Net Change	-24.0	-55.9				

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to the unanticipated number of corrective actions for the Navy Aircraft.

The unfavorable net change in the schedule variance is due to delays in parts and delays due in Multi-Year3 Procurement (MYP3) Lot 21.

V-22

Contract Identifi	ration

Appropriation:	RDT&E				
Contract Name:	V-22 MYP3 YR 2 (FY19 Lot 23)				
Contractor:	Bell-Boeing JPO				
Contractor Location:	401 Tiltrotor Drive Amarillo, TX 79111				
Contract Number:	N00019-17-C-0015/23				
Contract Type:	Fixed Price Incentive(Firm Target) (FPIF)				
Award Date:	June 29, 2018				
Definitization Date:	June 29, 2018				

Contract Price								
Initial Contract Price (\$M)		Current Contract Price (\$M)		Estimated Price At Completion (\$M)				
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager	
538.7	559.0	8	885.9	919.2	13	779.3	821.6	

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to incorporation of Engineering Change Proposals into the production line.

Contract Variance						
Cost Variance	Schedule Variance					
-3.7	-23.8					
-3.7	-23.8					
	Contract Variance Cost Variance -3.7 -3.7					

Cost and Schedule Variance Explanations

The unfavorable cumulative cost variance is due to the unanticipated number of corrective actions on Navy aircraft.

The unfavorable cumulative schedule variance is due to delays on Lot 21 and Lot 22, causing Lot 23 delays in starting work on multiple areas.

December 2019 SAR

Contract Identification					
Appropriation:	Procurement				
Contract Name:	V-22 AE1107C Engine Production				
Contractor:	Rolls-Royce Corporation				
Contractor Location:	2355 South Tibbs Avenue Indianapolis, IL 46241				
Contract Number:	N00019-17-C-0081/1				
Contract Type:	Firm Fixed Price (FFP)				
Award Date:	September 21, 2017				
Definitization Date:	September 21, 2017				

Contract Price							
Initial Contract Price (\$M) Current Contract Price (\$M) Estimated Price At Completion (e At Completion (\$M)			
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
288.7	N/A	131	288.7	N/A	131	288.7	288.7

Cost and Schedule Variance Explanations

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

Notes

An administrative change was required to reflect the corrected the Initial Contract Price Target (from 287.4 to 288.7), reported in last year's SAR.

Deliveries and Expenditures

	Deliveri	es		
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	2	100.00%
Production	395	395	462	85.50%
Total Program Quantity Delivered	397	397	464	85.56%

Expended and Appropriated (TY \$M)				
Total Acquisition Cost	55688.0	Years Appropriated	39	
Expended to Date	47988.2	Percent Years Appropriated	84.78%	
Percent Expended	86.17%	Appropriated to Date	51244.8	
Total Funding Years	46	Percent Appropriated	92.02%	

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

Operating and Support Cost

Cost Estimate Details		
Date of Estimate:	December 18, 2018	
Source of Estimate:	POE	
Quantity to Sustain:	454	
Unit of Measure:	Aircraft	
Service Life per Unit:	25.00 Years	
Fiscal Years in Service:	FY 2001 - FY 2053	

The O&S cost estimate does not include the 2 developmental aircraft, 4 HX-21 aircraft, and 2 test aircraft.

MV-22	Navy CMV-22	CV-22
10,000	10,000	10,000
0.7%	1.0%	0.6%
12.7%	10.0%	8%
360	48	54
276	36	50
35	35	36
420	420	432
7,870	1,139	1,236
	MV-22 10,000 0.7% 12.7% 360 276 35 420 7,870	MV-22Navy CMV-2210,00010,0000.7%1.0%12.7%10.0%360482763635354204207,8701,139

Sustainment Strategy

The V-22 Program Office is executing a Joint Sustainment Strategy that provides the product support elements for the Marine Corps MV-22, Air Force CV-22 fleets and Navy CMV-22. The sustainment strategy addresses all three levels of maintenance (Organizational, Intermediate and Depot). The cornerstones of the Joint Sustainment Strategy are the Performance Based Agreements (PBA) between the Program Office and the war fighters. The PBAs clearly define the war fighter's product support requirements to be achieved through the execution of the V-22 Joint Sustainment Strategy. The Joint Sustainment Strategy is executed via a myriad of processes and organizations to include DoD organic activities and commercial contractors. Multiple Performance Based Logistics contracts are used to support the V-22 Program.

The V-22 Program Common Configuration - Readiness and Modernization (CC-RAM) effort, introduced in August 2017, provides for the modification of Block B aircraft to a Block C configuration for up to 129 aircraft, funded with APN-5. This

common configuration concept will decrease non-mission capable rates by simplifying and streamlining supply and maintenance, increasing aircraft availability and fleet readiness. CC-RAM also significantly reduces the number of different aircraft configurations fielded and maintained, thus improving Life Cycle Support costs for the V-22 platform.

Antecedent Information

The V-22s antecedent aircraft are the CH-46E Sea Knight, CH-53D Sea Stallion, MH-53J/M Pave Low, and the C-2A Greyhound aircraft.

The CH-46E Sea Knight's O&S costs were used as the basis for the V-22 antecedent aircraft costs. The largest number of V-22s being procured (360 MV-22s) are being used to replace the CH-46E aircraft. The antecedent cost is based on the CH-46E's 3-year average (1999-2001) O&S cost data extracted from Naval Visibility and Management of Operating and Support Costs (VAMOSC) database for the 229 aircraft reported on during that time. Years 1999-2001 were used for the average because those years were the most stable and highest quantity per year resulting in the best representation for O&S costs. The antecedent aircraft began phasing out of the inventory in the following years. Since VAMOSC does not capture Indirect Support costs, the CH-46E Indirect Support cost is calculated by multiplying the CH-46E Unit-Level Manpower by the ratio of V-22 Indirect Support to V-22 Unit-Level Manpower. The data was normalized to BY 2005 \$M.

Annual O&S Costs BY2005 \$M				
Cost Element	V-22 Average Annual Cost Per Aircraft	CH-46E (Antecedent) Average Annual Cost Per Aircraft		
Unit-Level Manpower	1.420	0.449		
Unit Operations	0.360	0.058		
Maintenance	4.700	1.227		
Sustaining Support	0.380	0.038		
Continuing System Improvements	0.650	0.182		
Indirect Support	0.650	0.220		
Other				
Total	8.160	2.174		

		Total O&S	Cost \$M	
Hom				
item	Current Production A Objective/Threshol	Id	Current Estimate	CH-46E (Antecedent)
Base Year	80381.8	88420.0	83623.5	20782.3
Then Year	121543.7	N/A	136745.8	N/A

Equation to Translate Annual Cost to Total Cost

Total O&S Cost / (MV-22 USMC operating years + CMV-22 Navy operating years + CV-22 operating years) = Average Annual O&S Cost per Aircraft; therefore \$83.623B / (7,879 + 1,139 + 1,236) = \$8.16M.

O&S Cost Variance

Category	BY 2005 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2018 SAR	83623.5	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	83623.5	

Disposal Estimate Details		
Date of Estimate:	December 18, 2018	
Source of Estimate:	POE	
Disposal/Demilitarization Total Cost (BY 2005 \$M):	98.4	