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RCS: DD-A&T(Q&A)823-101



## **H-1 Upgrades (4BW/4BN) (H-1 Upgrades)**

As of FY 2021 President's Budget

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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## Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance  
ACAT - Acquisition Category  
ADM - Acquisition Decision Memorandum  
APB - Acquisition Program Baseline  
APPN - Appropriation  
APUC - Average Procurement Unit Cost  
\$B - Billions of Dollars  
BA - Budget Authority/Budget Activity  
Blk - Block  
BY - Base Year  
CAPE - Cost Assessment and Program Evaluation  
CARD - Cost Analysis Requirements Description  
CDD - Capability Development Document  
CLIN - Contract Line Item Number  
CPD - Capability Production Document  
CY - Calendar Year  
DAB - Defense Acquisition Board  
DAE - Defense Acquisition Executive  
DAMIR - Defense Acquisition Management Information Retrieval  
DoD - Department of Defense  
DSN - Defense Switched Network  
EMD - Engineering and Manufacturing Development  
EVM - Earned Value Management  
FOC - Full Operational Capability  
FMS - Foreign Military Sales  
FRP - Full Rate Production  
FY - Fiscal Year  
FYDP - Future Years Defense Program  
ICE - Independent Cost Estimate  
IOC - Initial Operational Capability  
Inc - Increment  
JROC - Joint Requirements Oversight Council  
\$K - Thousands of Dollars  
KPP - Key Performance Parameter  
LRIP - Low Rate Initial Production  
\$M - Millions of Dollars  
MDA - Milestone Decision Authority  
MDAP - Major Defense Acquisition Program  
MILCON - Military Construction  
N/A - Not Applicable  
O&M - Operations and Maintenance  
ORD - Operational Requirements Document  
OSD - Office of the Secretary of Defense  
O&S - Operating and Support  
PAUC - Program Acquisition Unit Cost

PB - President's Budget  
PE - Program Element  
PEO - Program Executive Officer  
PM - Program Manager  
POE - Program Office Estimate  
RDT&E - Research, Development, Test, and Evaluation  
SAR - Selected Acquisition Report  
SCP - Service Cost Position  
TBD - To Be Determined  
TY - Then Year  
UCR - Unit Cost Reporting  
U.S. - United States  
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)  
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

## Program Information

**Program Name**

H-1 Upgrades (4BW/4BN) (H-1 Upgrades)

**DoD Component**

Navy

## Responsible Office

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## References

**SAR Baseline (Production Estimate)**

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 22, 2008

**Approved APB**

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated February 11, 2011



## Mission and Description

The AH-1Z and UH-1Y were designed as upgrades to the AH-1W and UH-1N aircraft. The mission of the AH-1Z attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1Y utility helicopter is to provide command, control and assault support under day/night and adverse weather conditions. Major modifications incorporated in the UH-1Y and AH-1Z include a new four-bladed rotor system and fully integrated common cockpits/avionics.

## Executive Summary

### Program Highlights Since Last Report

This is the final SAR submission for the H-1 Upgrades program.

Pursuant to section 2432 of title 10, United States Code, this is the final SAR submission for the H-1 Upgrades, because the program is 90% or more expended.

Production of H-1 aircraft continues at Bell Helicopter with final assembly and delivery occurring in Amarillo, Texas. There are 373 aircraft (Lots 1-16) on contract, which includes 10 UH-1Y remanufactured and 150 Build New UH-1Y, 37 AH-1Z remanufactured and 176 AH-1Z Build New (ZBN) aircraft (including 12 Pakistan and 12 Bahrain AH-1ZBN aircraft). As of January 30, 2020, 293 domestic production aircraft (160 UH-1Ys, 37 remanufactured AH-1Zs, and 96 AH-1ZBNs) have been delivered to the Fleet either on or ahead of schedule. The last UH-1Y production aircraft was delivered on April 30, 2018. The US Marine Corps program of record remains 349 aircraft (160 UH-1Ys and 189 AH-1Zs) and is fully funded.

The program office continues to execute Pakistan case PK-P-SBO, 12 AH-1Zs, and completed delivery of the last aircraft on September 30, 2018. On October 7, 2018 Bahrain signed a Letter of Acceptance (LOA) to purchase 12 AH-1Zs with deliveries expected to start in CY 2021. Czech Republic signed an LOA on December 12, 2019 for the purchase of 4 AH-1Zs and 8 UH-1Ys. Deliveries for the Czech case are expected to start in CY2023.

The program office continues to make progress on improving material availability and reliability while expanding depot capability. Readiness corrective action plans continue to progress and several improvements are being validated or have fielded, improving readiness over the past 12 months. Additional efforts are being pursued to continue to accelerate readiness recovery. Organic depot capability continues to increase across the Fleet Readiness Centers for major weapons systems.

In June 2019, the program office began compiling and identifying metrics needed to build the H-1 Sustainment Program Baseline (SPB) in support of the HQMC AVN and USN RD&A memo, H-1 SPB Pilot for Fiscal Year 2020, dated 21 Nov 2019.

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 1996	EMD Contract Award with Bell Helicopter
October 1996	Milestone II Decision received with the purpose of addressing deficiencies in operational capability, performance, power availability, reliability, availability, and maintainability of the legacy AH-1W and UH-1N aircraft
October 1996	Original APB Development
June 1997	Preliminary Design Review (PDR) Complete
September 1998	Critical Design Review (CDR) Complete
June 2000	APB Change #1 – Unfunded/underfunded program requirements identified; Increased overhead charges; Higher than planned labor rates; Subcontractor cost overruns
May 2002	Nunn McCurdy Breach – Cost increase due to underestimation of scope, program delays, requirements changes
May 2002	APB Change #2 – Revised business base assumptions; Increased rates due to reduction in V-22 quantities; Late design changes; Parts shortages; Added scope; Earned Value Management compliance issues
December 2003	Lot 1 Production contract award to Bell Helicopter procuring 6 UH-1Y, 3 AH-1Z Remanufactured
April 2005	Lot 2 Production contract award to Bell Helicopter procuring 4 UH-1Y, 3 AH-1Z Remanufactured
April 2005	APB Change #3 – Increased cost due to underestimation of scope, program delays, requirements changes
July 2006	Lot 3 Production contract award to Bell Helicopter procuring 7 UH-1Y
January 2007	Operational Evaluation (OPEVAL) Phase I Testing for UH-1Y and AH-1Z
July 2007	Lot 4 Production contract award to Bell Helicopter procuring 9 UH-1Y, 2 AH-1Z Remanufactured
July 2007	APB Change #4 – Cost estimates higher than budgeted; Increased rates and material costs; Delayed deliveries; Engineering and Suitability issues; System maturity delayed OPEVAL
January 2008	Lot 5 Production contract award to Bell Helicopter procuring 11 UH-1Y, 4 AH-1Z Remanufactured
April 2008	UH-1Y Initial Operational Test and Evaluation (IOT&E)
May 2008	OPEVAL Phase II Testing completed for UH-1Y
August 2008	UH-1Y achieved IOC
September 2008	UH-1Y approved for MS III/FRP
November 2008	Nunn McCurdy Breach – Increased Prime Contractor material/labor costs; Government Furnished Equipment (GFE); Non-recurring production investments; Operational Evaluation Phase I corrections; Increased procurement objective (280 to 349 Program of Record (POR) – Remanufactured versus AH-1Z Build New)
December 2008	Production APB – Revised OPEVAL Phase II update; Additional LRIPs added; Added separate MS III for AH-1Z; Various KPPs updated; Production Cost update; Program of Record quantity increase
March 2009	Lot 6 Production contract award to Bell Helicopter procuring 15 UH-1Y and 5 AH-1Z Remanufactured aircraft
February 2010	Lot 8 Production contract award to Bell Helicopter procuring 19 UH-1Y, 8 AH-1Z



	Remanufactured and 6 AH-1ZBNs
June 2010	Lot 7 Production contract award to Bell Helicopter procuring 18 UH-1Y , 9 AH-1Z Remanufactured and 2 AH-1ZBNs
July 2010	OPEVAL Phase II Testing AH-1Z
July 2010	AH-1Z IOT&E
November 2010	AH-1Z MS III/FRP
February 2011	AH-1Z achieved IOC
February 2011	Production APB Change #1 – Navy Support Date (NSD); Force Protection (seating) KPP update; Production Cost update
October 2012	Lot 9 Production contract award to Bell Helicopter procuring 15 UH-1Y , 3 AH-1Z Remanufactured and 7 AH-1ZBNs
December 2012	Lot 10 Production contract award to Bell Helicopter procuring 16 UH-1Y and 12 AH-1ZBNs
May 2013	Lot 11 Production contract award to Bell Helicopter procuring 12 UH-1Y and 12 AH-1ZBNs
March 2014	Lot 12 Production contract award to Bell Helicopter procuring 15 UH-1Y and 16 AH-1ZBNs
November 2014	Lot 13 Production contract award to Bell Helicopter procuring 27 AH-1ZBNs
February 2017	Lot 14 Production contract award to Bell Helicopter procuring 27 AH-1ZBNs
April 2018	Last UH-1Y aircraft delivered
August 2018	Lot 15 Production contract award to Bell Helicopter procuring 29 AH-1ZBNs
January 2019	Lot 16 Production contract award to Bell Helicopter procuring 25 AH-1ZBNs. Last domestic Lot Production Contract to satisfy POR of 349 aircraft.
June 2019	Development of Sustainment Program Baseline (SPB) metrics
November 2019	Active component transitions complete
January 2020	Execution started on H-1 SPB Pilot

## Threshold Breaches

### APB Breaches

<b>Schedule</b>		<input type="checkbox"/>
<b>Performance</b>		<input type="checkbox"/>
<b>Cost</b>	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
<b>O&amp;S Cost</b>		<input type="checkbox"/>
<b>Unit Cost</b>	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

### Nunn-McCurdy Breaches

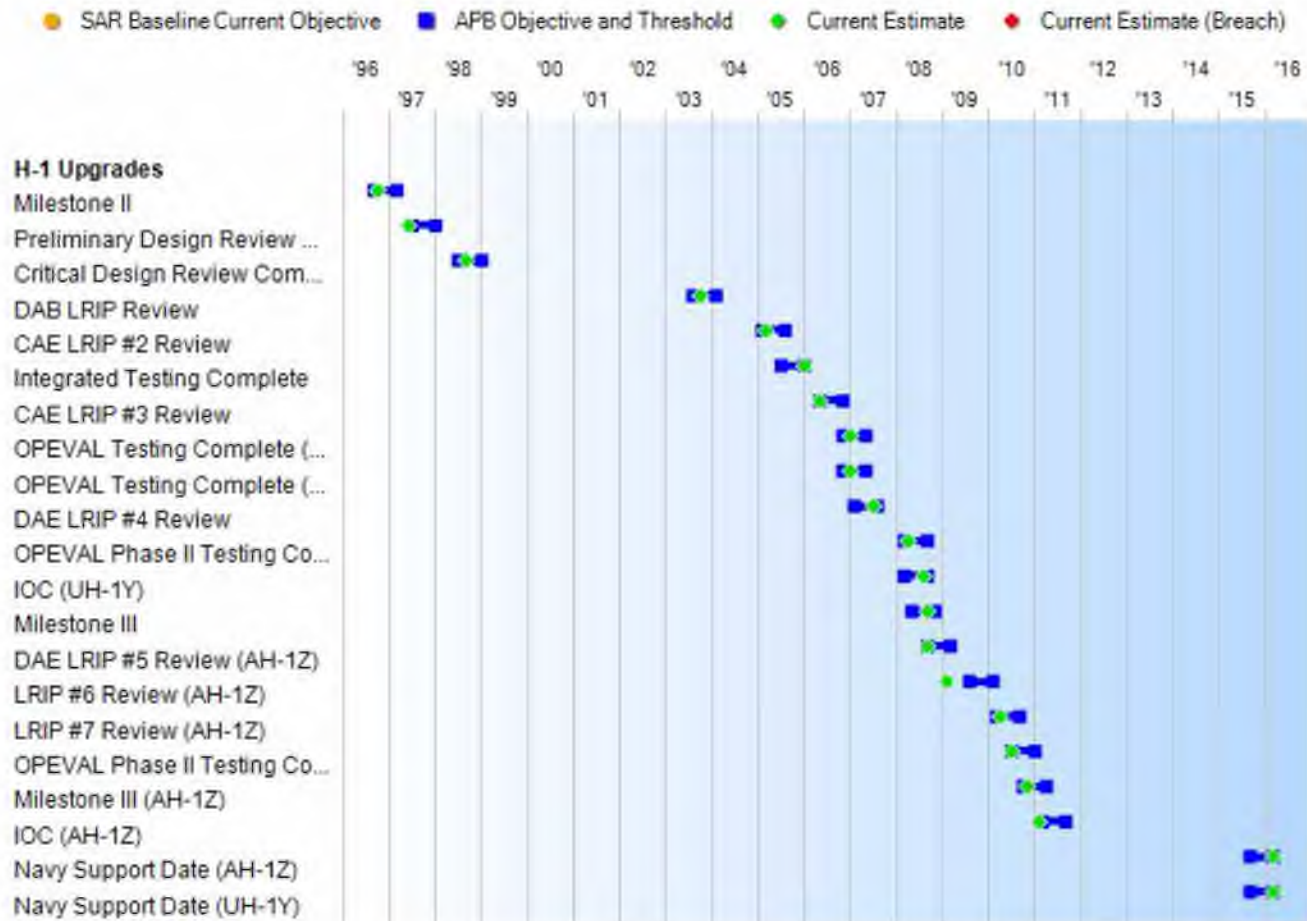
#### Current UCR Baseline

PAUC	None
APUC	None

#### Original UCR Baseline

PAUC	None
APUC	None

## Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone II	Sep 1996	Sep 1996	Mar 1997	Oct 1996
Preliminary Design Review Complete	Jul 1997	Jul 1997	Jan 1998	Jun 1997
Critical Design Review Complete	Jul 1998	Jul 1998	Jan 1999	Sep 1998
DAB LRIP Review	Aug 2003	Aug 2003	Feb 2004	Oct 2003
CAE LRIP #2 Review	Feb 2005	Feb 2005	Aug 2005	Mar 2005
Integrated Testing Complete	Jul 2005	Jul 2005	Jan 2006	Jan 2006
CAE LRIP #3 Review	May 2006	May 2006	Nov 2006	May 2006
OPEVAL Testing Complete (AH-1Z)	Nov 2006	Nov 2006	May 2007	Jan 2007
OPEVAL Testing Complete (UH-1Y)	Nov 2006	Nov 2006	May 2007	Jan 2007
DAE LRIP #4 Review	Feb 2007	Feb 2007	Aug 2007	Jul 2007
OPEVAL Phase II Testing Complete (UH-1Y)	Mar 2008	Mar 2008	Sep 2008	Apr 2008
IOC (UH-1Y)	Mar 2008	Mar 2008	Sep 2008	Aug 2008
Milestone III	May 2008	May 2008	Nov 2008	Sep 2008
DAE LRIP #5 Review (AH-1Z)	Sep 2008	Sep 2008	Mar 2009	Sep 2008
LRIP #6 Review (AH-1Z)	Aug 2009	Aug 2009	Feb 2010	Feb 2009
LRIP #7 Review (AH-1Z)	Mar 2010	Mar 2010	Sep 2010	Apr 2010
OPEVAL Phase II Testing Complete (AH-1Z)	Jul 2010	Jul 2010	Jan 2011	Jul 2010
Milestone III (AH-1Z)	Oct 2010	Oct 2010	Apr 2011	Nov 2010
IOC (AH-1Z)	Mar 2011	Mar 2011	Sep 2011	Feb 2011
Navy Support Date (AH-1Z)	Mar 2012	Sep 2015	Mar 2016	Mar 2016
Navy Support Date (UH-1Y)	Mar 2012	Sep 2015	Mar 2016	Mar 2016

#### Change Explanations

None

#### Acronyms and Abbreviations

CAE - Component Acquisition Executive  
OPEVAL - Operational Evaluation



## Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
4BW (AH-1W/AH-1Z)				
MFHBA (hrs)				
35.0	35.0	24.0	63.8	63.8
MMH/FH (hrs)				
3.6	3.6	4.3	2.5	2.5
Cruise Speed (kts)				
165	165	135	139	139
Payload (Hot Day) (lbs)				
3500 lbs	3500 lbs	2500 lbs 6 Wing Stations 4 Universal Under Wing Stations	3429	3429
Weapon Stations				
Universal Mounts				
6	6	4	4	4
Precision Guided Munitions				
16	16	12	16	16
Maneuverability/Agility (G's)				
-0.5 to +2.5	-0.5 to +2.5	-0.5 to +2.5	-0.5 to +2.5	-0.5 to +2.5
Mission Radius (NM)				
200 NM	200 NM	110 NM	135 NM x 1	135 NM x 1
Shipboard Compatibility				
Fully compatible to include blade fold.	Fully compatible to include blade fold.	Fully compatible to include blade fold.	Fully compatible to include blade fold.	Fully compatible to include blade fold.
Interoperability				
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	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	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	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	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 KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	transition to Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an IATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.
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#### Force Protection (Seating)

Two AH-1Z pilot seats that are stroking, crashworthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10 Gs laterally.	Two AH-1Z pilot seats that are stroking, crashworthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10 Gs laterally.	Two AH-1Z pilot seats that are stroking, crashworthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10 Gs laterally.	Two AH-1Z pilot seats that are stroking, crashworthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10Gs laterally.	Two AH-1Z pilot seats that are stroking, crashworthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10Gs laterally.
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#### Survivability (Ballistic Tolerance/Hardening)

Airframe structure and flight critical systems shall be ballistic tolerant/hardened against 23	Airframe structure and flight critical systems shall be ballistic tolerant/hardened against 23	Airframe structure and flight critical systems shall be ballistic tolerant/hardened against	Airframe structure and flight critical systems shall be ballistic tolerant/hardened	Airframe structure and flight critical systems shall be ballistic tolerant/hardened
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mm HEI.	mm HEI.	12.7 mm API.	against 12.7 mm API.	against 12.7 mm API.
<b>4BN (UH-1N/UH-1Y)</b>				
<b>MFHBA (hrs)</b>				
40.2	40.2	33.1	56.6	56.6
<b>MMH/FH (hrs)</b>				
2.9	2.9	3.9	2.0	2.0
<b>Cruise Speed (kts)</b>				
165	165	140	155	155
<b>Payload (Hot Day) (lbs)</b>				
4500	4500	2800	2982	2982
<b>Weapon Stations</b>				
2 Univ. Mounts	2 Univ. Mounts	2 Hard Mounts	2 Hard Mounts	2 Hard Mounts
<b>Maneuverability/Agility (G's)</b>				
-0.5 to +2.5	-0.5 to +2.5	-0.5 to +2.3	-0.5 to +2.3	-0.5 to +2.3
<b>Mission Radius (NM)</b>				
200 NM	200 NM	110 NM	130 NM	130 NM
<b>Shipboard Compatibility</b>				
Fully compatible to include blade fold.	Fully compatible to include blade fold.	Fully compatible to include blade fold.	Fully compatible to include blade fold.	Fully compatible to include blade fold.
<b>Interoperability</b>				
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 KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance	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 KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance	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 transition to Net-Centric military operations to include: 1) DISR-mandated GIG IT standards and profiles identified in the TV-1, 2) DISR-mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services	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 KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance	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 KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services 4) Information assurance



requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	4) Information assurance requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an IATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.
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#### Force Protection (Seating)

Two UH-1Y pilot seats and ten UH-1Y cabin seats that are stroking, crash-worthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10 Gs laterally.	Two UH-1Y pilot seats and ten UH-1Y cabin seats that are stroking, crash-worthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10 Gs laterally.	Two UH-1Y pilot seats and ten UH-1Y cabin seats that are stroking, crash-worthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10 Gs laterally.	Two UH-1Y pilot seats and ten UH-1Y cabin seats that are stroking, crashworthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10Gs laterally.	Two UH-1Y pilot seats and ten UH-1Y cabin seats that are stroking, crashworthy, and capable of sustaining 20Gs longitudinal, 20Gs vertical, and 10Gs laterally.
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#### Survivability (Ballistic Tolerance/Hardening)

Airframe structure and flight critical systems shall be ballistic tolerant/hardened against 23 mm HEI.	Airframe structure and flight critical systems shall be ballistic tolerant/hardened against 23 mm HEI.	Airframe structure and flight critical systems shall be ballistic tolerant/hardened against 12.7 mm API.	Airframe structure and flight critical systems shall be ballistic tolerant/hardened against 12.7 mm API.	Airframe structure and flight critical systems shall be ballistic tolerant/hardened against 12.7 mm API.
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#### Requirements Reference

UH-1Y CPD and AH-1Z CPD dated June 11, 2007 as modified by JROC Memorandum 195-08 dated October 14, 2008

#### Change Explanations

None



**Acronyms and Abbreviations**

API - Armor Piercing Incendiary  
ATO - Authority to Operate  
DAA - Designated Approving Authority  
DISR - DoD Information Technology Standards Registry  
FRACAS - Failure Reporting, Analysis and Corrective Action System  
G's - Gravitational forces  
GIG - Global Information Grid  
HEI - High Explosive Incendiary  
hrs - Hours  
IATO - Interim Authority to Operate  
IT - Information Technology  
KIP - Key Interface Protocol  
kts - Knots  
lbs - Pounds  
MFHBA - Mean Flight Hours Between Abort  
mm - Millimeter  
MMH/FH - Maintenance Man Hours per Flight Hours  
NCOW - Net-Centric Operation and Warfare  
NM - Nautical Miles  
R&M - Reliability and Maintainability  
RM - Reference Model  
TV-1 - Technical Standards Profile  
Univ. - Universal

## Track to Budget

### RDT&E

Appn	BA	PE	
Navy	1319	05	0604245N
Project	Name		
2279	H-1 Upgrades		
			(Sunk)

### Procurement

Appn	BA	PE	
Navy	1506	01	0206131M
Line Item	Name		
0178	H-1 Upgrades (UH-1Y/AH-1Z)		
Navy	1506	06	0206131M
Line Item	Name		
0605	Spares and Repair Parts		
			(Sunk)

### MILCON

Appn	BA	PE	
Navy	1205	01	0216496M
Project	Name		
991	H-1 Y/Z Helicopter Gearbox Repair & Test Facility		
			(Sunk)

## Cost and Funding

### Cost Summary

Total Acquisition Cost							
Appropriation	BY 2008 \$M			BY 2008 \$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	1799.2	1848.3	2033.1	1704.0	1644.1	1696.2	1537.1
Procurement	9404.2	10088.4	11097.2	9762.3	10542.7	11022.1	10722.0
Flyaway	--	--	--	8144.1	--	--	8996.6
Recurring	--	--	--	7665.2	--	--	8497.8
Non Recurring	--	--	--	478.9	--	--	498.8
Support	--	--	--	1618.2	--	--	1725.4
Other Support	--	--	--	1369.6	--	--	1474.1
Initial Spares	--	--	--	248.6	--	--	251.3
MILCON	0.0	16.3	17.9	16.0	0.0	17.6	17.6
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	11203.4	11953.0	N/A	11482.3	12186.8	12735.9	12276.7

#### 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		4	4
Procurement	349	349	349
Total	353	353	353

#### Quantity Notes

The four RDT&E aircraft include two UH-1Ys and two AH-1Zs. The 349 Procurement aircraft include 37 AH-1W helicopters remanufactured into AH-1Zs, 152 AH-1Z Build New models, 10 UH-1N helicopters remanufactured into UH-1Ys, and 150 new UH-1Y models. Program currently funded to Program of Record 349 aircraft.



## 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	1537.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1537.1
Procurement	10668.9	44.0	7.3	1.0	0.1	0.3	0.4	0.0	10722.0
MILCON	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2021 Total	12223.6	44.0	7.3	1.0	0.1	0.3	0.4	0.0	12276.7
PB 2020 Total	12385.7	62.0	7.4	7.5	7.7	7.8	0.0	0.0	12478.1
Delta	-162.1	-18.0	-0.1	-6.5	-7.6	-7.5	0.4	0.0	-201.4

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	349	0	0	0	0	0	0	0	349
PB 2021 Total	4	349	0	0	0	0	0	0	0	353
PB 2020 Total	4	349	0	0	0	0	0	0	0	353
Delta	0	0	0	0	0	0	0	0	0	0



## Cost and Funding

### Annual Funding By Appropriation

Annual Funding							
1319   RDT&E   Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1996	--	--	--	--	--	--	10.9
1997	--	--	--	--	--	--	67.9
1998	--	--	--	--	--	--	81.3
1999	--	--	--	--	--	--	116.7
2000	--	--	--	--	--	--	178.5
2001	--	--	--	--	--	--	138.2
2002	--	--	--	--	--	--	167.4
2003	--	--	--	--	--	--	232.9
2004	--	--	--	--	--	--	99.1
2005	--	--	--	--	--	--	168.2
2006	--	--	--	--	--	--	58.6
2007	--	--	--	--	--	--	26.4
2008	--	--	--	--	--	--	12.6
2009	--	--	--	--	--	--	4.4
2010	--	--	--	--	--	--	28.1
2011	--	--	--	--	--	--	57.6
2012	--	--	--	--	--	--	60.6
2013	--	--	--	--	--	--	27.7
Subtotal	4	--	--	--	--	--	1537.1

Annual Funding							
1319   RDT&E   Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2008 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
1996	--	--	--	--	--	--	13.3
1997	--	--	--	--	--	--	82.0
1998	--	--	--	--	--	--	97.4
1999	--	--	--	--	--	--	138.1
2000	--	--	--	--	--	--	208.3
2001	--	--	--	--	--	--	159.1
2002	--	--	--	--	--	--	190.7
2003	--	--	--	--	--	--	261.5
2004	--	--	--	--	--	--	108.3
2005	--	--	--	--	--	--	179.0
2006	--	--	--	--	--	--	60.5
2007	--	--	--	--	--	--	26.6
2008	--	--	--	--	--	--	12.5
2009	--	--	--	--	--	--	4.3
2010	--	--	--	--	--	--	27.0
2011	--	--	--	--	--	--	54.1
2012	--	--	--	--	--	--	56.0
2013	--	--	--	--	--	--	25.3
Subtotal	4	--	--	--	--	--	1704.0

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
2001	--	--	--	--	--	6.0	6.0
2002	--	--	--	--	--	--	--
2003	--	--	--	--	--	--	--
2004	9	197.8	--	23.8	221.6	105.9	327.5
2005	7	136.9	--	18.7	155.6	78.3	233.9
2006	7	150.9	--	42.2	193.1	162.0	355.1
2007	11	228.8	--	136.5	365.3	170.1	535.4
2008	15	315.5	--	25.2	340.7	154.3	495.0
2009	24	514.0	--	42.6	556.6	80.5	637.1
2010	27	655.7	--	34.8	690.5	70.7	761.2
2011	31	688.5	--	77.6	766.1	127.0	893.1
2012	25	567.6	--	46.3	613.9	120.0	733.9
2013	30	772.8	--	3.8	776.6	89.6	866.2
2014	23	574.3	--	1.6	575.9	85.6	661.5
2015	31	792.3	--	--	792.3	106.8	899.1
2016	29	780.5	--	--	780.5	60.3	840.8
2017	26	728.3	--	8.7	737.0	110.3	847.3
2018	29	750.2	--	8.3	758.5	73.3	831.8
2019	25	643.7	--	--	643.7	100.3	744.0
2020	--	--	--	28.7	28.7	15.3	44.0
2021	--	--	--	--	--	7.3	7.3
2022	--	--	--	--	--	1.0	1.0
2023	--	--	--	--	--	0.1	0.1
2024	--	--	--	--	--	0.3	0.3
2025	--	--	--	--	--	0.4	0.4
Subtotal	349	8497.8	--	498.8	8996.6	1725.4	10722.0



Annual Funding 1506   Procurement   Aircraft Procurement, Navy							
Fiscal Year	Quantity	BY 2008 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	--	--	6.8	6.8
2002	--	--	--	--	--	--	--
2003	--	--	--	--	--	--	--
2004	9	212.6	--	25.6	238.2	113.8	352.0
2005	7	143.1	--	19.6	162.7	81.8	244.5
2006	7	153.5	--	42.9	196.4	164.8	361.2
2007	11	227.5	--	135.7	363.2	169.1	532.3
2008	15	309.0	--	24.7	333.7	151.1	484.8
2009	24	496.5	--	41.2	537.7	77.7	615.4
2010	27	620.4	--	32.9	653.3	66.9	720.2
2011	31	638.8	--	72.0	710.8	117.8	828.6
2012	25	519.1	--	42.3	561.4	109.8	671.2
2013	30	699.3	--	3.4	702.7	81.1	783.8
2014	23	513.0	--	1.4	514.4	76.5	590.9
2015	31	697.2	--	--	697.2	94.0	791.2
2016	29	672.9	--	--	672.9	52.0	724.9
2017	26	615.7	--	7.4	623.1	93.2	716.3
2018	29	622.7	--	6.9	629.6	60.8	690.4
2019	25	523.9	--	--	523.9	81.7	605.6
2020	--	--	--	22.9	22.9	12.2	35.1
2021	--	--	--	--	--	5.7	5.7
2022	--	--	--	--	--	0.8	0.8
2023	--	--	--	--	--	0.1	0.1
2024	--	--	--	--	--	0.2	0.2
2025	--	--	--	--	--	0.3	0.3
Subtotal	349	7665.2	--	478.9	8144.1	1618.2	9762.3



Cost Quantity Information		
1506   Procurement   Aircraft Procurement, Navy		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2008 \$M
2001	--	--
2002	--	--
2003	--	--
2004	9	212.6
2005	7	143.1
2006	7	153.5
2007	11	227.5
2008	15	309.0
2009	24	496.5
2010	27	572.7
2011	31	632.4
2012	25	521.2
2013	30	693.0
2014	23	517.7
2015	31	695.1
2016	29	680.1
2017	26	622.5
2018	29	629.4
2019	25	558.9
2020	--	--
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
Subtotal	349	7665.2

Annual Funding 1205   MILCON   Military Construction, Navy and Marine Corps		
Fiscal Year	TY \$M	
	Total Program	
2012		17.6
Subtotal		17.6

Annual Funding 1205   MILCON   Military Construction, Navy and Marine Corps		
Fiscal Year	BY 2008 \$M	
	Total Program	
2012		16.0
Subtotal		16.0



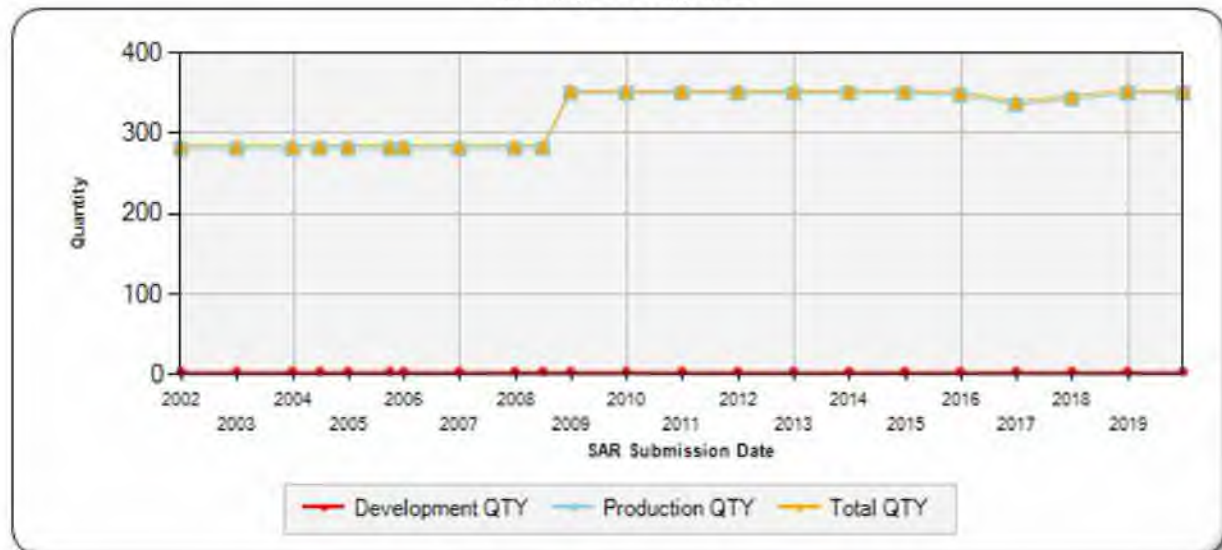
## Charts

### H-1 Upgrades first began SAR reporting in December 1997

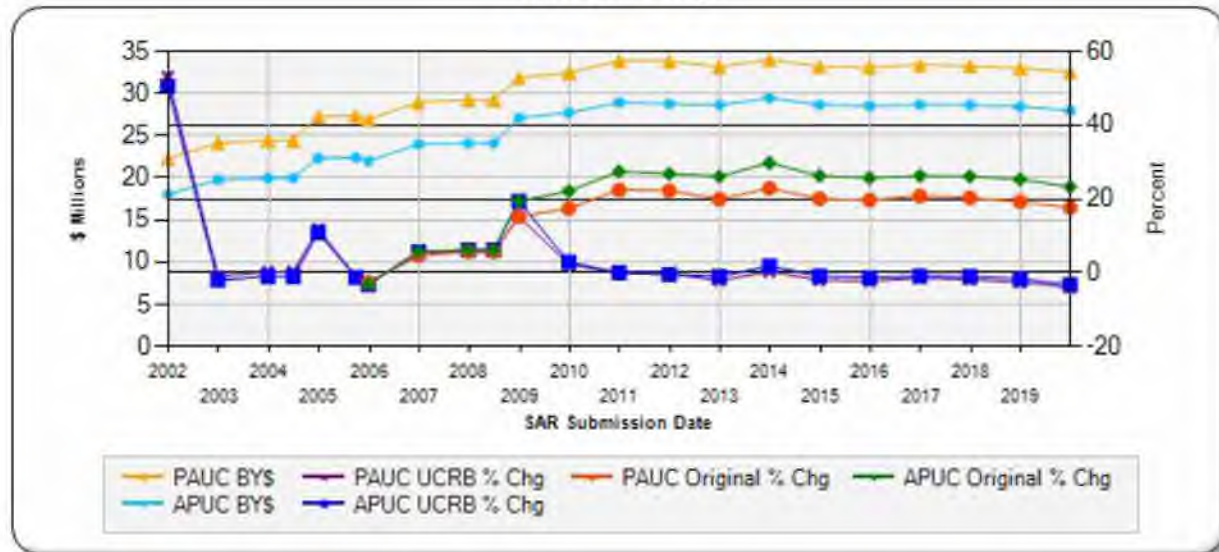
Program Acquisition Cost - H-1 Upgrades  
Base Year 2008 \$M



Quantity - H-1 Upgrades



Unit Cost - H-1 Upgrades  
Base Year 2008 \$M



## Risks

### Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Milestone III (September 2008)	
1.	Modification schedule to support 1st UH-1Y Deployment. Modified aircraft kit deliveries and installation timeline is the limiting factor for training, work up at sea periods and the January 2009 MEU deployment.
2.	Demonstrated technical performance to support UH-1Y FRP and AH-1Z LRIP Decisions due to Operational Test deficiencies (OT-IIC2 test report).
3.	Bell supply chain management to support increase to full rate production. Poor performance of key suppliers, long lead times, and parts shortages.
Current Estimate (December 2019)	
1.	Production and Fleet transitions continue to be on or ahead of schedule and within budget.



## Risks

### Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (February 2011)	
1.	Insufficient funding to execute aircraft quantity requirements: Two Forward Price Rate Agreement (FPRA) increases, Apr FPRA and Nov Forward Price Rate Recommendation (driven by a reduction in the base vs predictions, erosion in the commercial business, efficiencies in production, a recent strike, and pension liabilities) and potential additional rate impacts due to Pension Protection Act compliance and projected business base loss in FY14 due to decreasing procurement of V-22s are creating additional budget pressure to execute yearly budgeted a/c quantities and pressurizing APB and Nunn-McCurdy acquisition thresholds.
2.	Bell supply chain management to support increase to Full Rate Production: Poor performance of key suppliers, long lead times (bearings, forgings, castings), LLT purchase orders, staffing, parts shortages, and limited capacity in critical suppliers.
3.	Failure to meet total ownership cost reduction goals: Delayed I and D level standup, dynamic component DL&T disposition, extended interim support period, components not making reliability targets.
4.	Ability to achieve affordability targets to meet inventory objectives: Higher than anticipated costs due to Bell enterprise growth (overhead rates); raw materials; cabin; supplier performance; increased labor hours. Two rate increases, Apr Forward Price Rate Agreement and Nov Forward Price Rate Brochure (driven by a reduction in the base vs predictions, erosion in the commercial business, efficiencies in production, a recent strike, and pension liabilities) have recently created additional budget pressure.
Original Baseline Estimate (October 1996)	
1.	The estimates of avionics and initial support/spares differed by about \$115 million. The CAIG employed historical factors that reflect unknown risks and were somewhat higher than the Program Office's detailed build-up.
2.	The estimates of recurring material costs differed by \$41 million because the CAIG assumed, based on information provided by Bell, that there would be a break in AH-1W production before 4BW procurement began.
Revised Original Estimate (April 2005)	
1.	This does not apply.
Current Procurement Cost (December 2019)	
1.	Production and Fleet transitions continue to be on or ahead of schedule and within budget.

**Low Rate Initial Production**

Item	Initial LRIP Decision	Current Total LRIP
<b>Approval Date</b>	10/22/2003	6/7/2010
<b>Approved Quantity</b>	28	55
<b>Reference</b>	LRIP ADM	LRIP VII ADM
<b>Start Year</b>	2004	2004
<b>End Year</b>	2005	2010

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the need to permit an orderly increase in the production rate and efficiency until successful completion of operational testing.

## Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
Czech Republic	12/12/2019	12	645.9	FMS Case EZ-P-SBF, (8) UH-1Y and (4) AH-1Z helicopters, initial support, and training.
Bahrain	11/28/2018	12	658.5	FMS Case BA-P-BSO, AH-1Z helicopters, initial support, and training.
Pakistan	7/10/2015	12	621.4	FMS Case PK-P-BSO, AH-1Z helicopters, initial support, and training.

### Notes

Total Cost reflects the total Case value as defined by the signed and implemented Letter of Offer and Acceptance (LOA) for both Pakistan, Bahrain, and Czech.

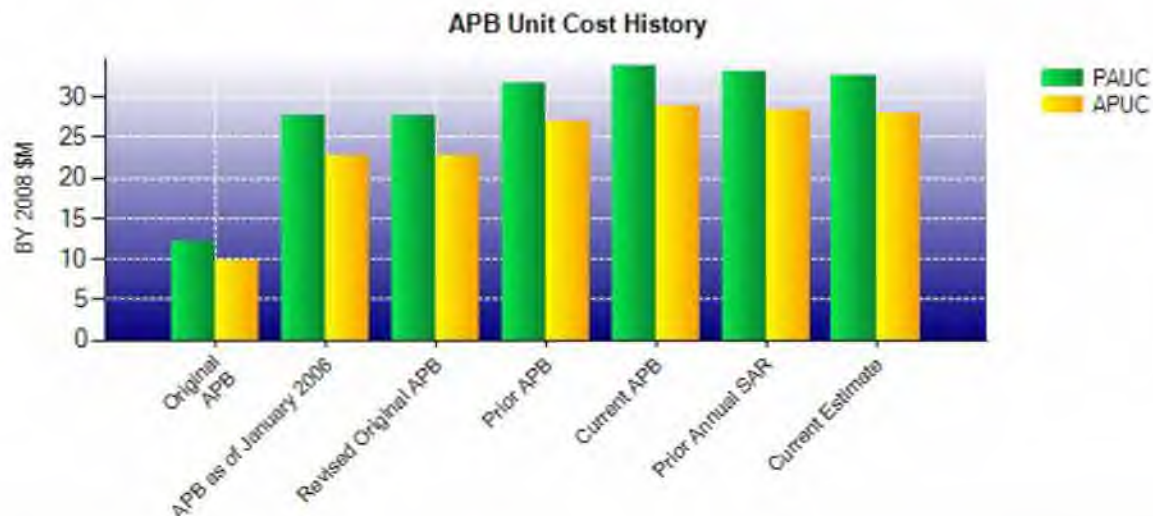


**Nuclear Costs**

None

**Unit Cost**

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2008 \$M	BY 2008 \$M	% Change
	Current UCR Baseline (Feb 2011 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	11953.0	11482.3	
Quantity	353	353	
Unit Cost	33.861	32.528	-3.94
Average Procurement Unit Cost			
Cost	10088.4	9762.3	
Quantity	349	349	
Unit Cost	28.907	27.972	-3.23
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2008 \$M	BY 2008 \$M	% Change
	Revised Original UCR Baseline (Apr 2005 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	7852.2	11482.3	
Quantity	284	353	
Unit Cost	27.649	32.528	+17.65
Average Procurement Unit Cost			
Cost	6352.9	9762.3	
Quantity	280	349	
Unit Cost	22.689	27.972	+23.28



APB Unit Cost History					
Item	Date	BY 2008 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Oct 1996	12.089	9.903	12.491	10.554
APB as of January 2006	Apr 2005	27.649	22.689	28.172	23.843
Revised Original APB	Apr 2005	27.649	22.689	28.172	23.843
Prior APB	Dec 2008	31.738	26.946	34.524	30.208
Current APB	Feb 2011	33.861	28.907	36.079	31.582
Prior Annual SAR	Dec 2018	32.981	28.430	35.349	31.299
Current Estimate	Dec 2019	32.528	27.972	34.778	30.722

### 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	
12.491	-0.078	-1.056	1.772	2.351	15.397	0.000	3.647	22.033	34.524

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
34.524	-0.669	-0.025	-0.073	0.274	0.625	0.000	0.122	0.254	34.778



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	
10.554	-0.003	-0.686	1.722	1.632	13.299	0.000	3.690	19.654	30.208

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
30.208	-0.684	-0.026	-0.074	0.000	1.174	0.000	0.124	0.514	30.722

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	Sep 1996	Sep 1996	Oct 1996
Milestone III	N/A	Feb 2004	May 2008	Sep 2008
IOC	N/A	Jun 2005	Mar 2008	Aug 2008
Total Cost (TY \$M)	N/A	3547.5	12186.8	12276.7
Total Quantity	N/A	284	353	353
PAUC	N/A	12.491	34.524	34.778

**Cost Variance**

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	1644.1	10542.7	--	12186.8
Previous Changes				
Economic	+2.4	-233.7	+0.3	-231.0
Quantity	--	-8.9	--	-8.9
Schedule	--	-25.8	--	-25.8
Engineering	+96.7	--	--	+96.7
Estimating	-206.1	+642.6	+17.3	+453.8
Other	--	--	--	--
Support	--	+6.5	--	+6.5
Subtotal	-107.0	+380.7	+17.6	+291.3
Current Changes				
Economic	--	-5.1	--	-5.1
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	-233.0	--	-233.0
Other	--	--	--	--
Support	--	+36.7	--	+36.7
Subtotal	--	-201.4	--	-201.4
Total Changes	-107.0	+179.3	+17.6	+89.9
Current Estimate	1537.1	10722.0	17.6	12276.7

Summary BY 2008 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	1799.2	9404.2	--	11203.4
Previous Changes				
Economic	--	--	--	--
Quantity	--	-5.6	--	-5.6
Schedule	--	-27.2	--	-27.2
Engineering	+83.6	--	--	+83.6
Estimating	-178.8	+546.7	+16.0	+383.9
Other	--	--	--	--
Support	--	+4.1	--	+4.1
Subtotal	-95.2	+518.0	+16.0	+438.8
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	--	-191.6	--	-191.6
Other	--	--	--	--
Support	--	+31.7	--	+31.7
Subtotal	--	-159.9	--	-159.9
Total Changes	-95.2	+358.1	+16.0	+278.9
Current Estimate	1704.0	9762.3	16.0	11482.3

Previous Estimate: December 2018



Procurement		\$M	
Current Change Explanations		Base Year	Then Year
Revised escalation indices. (Economic)		N/A	-5.1
Adjustment for current and prior escalation. (Estimating)		+3.9	+4.4
Adjustment for FY 2017 Below Threshold Reprogramming to CH-53K Production program. (Estimating)		-6.5	-7.7
Adjustment for FY 2018 and FY 2019 Above Threshold Reprogramming to CH-53K Research and Development program. (Estimating)		-130.1	-158.0
Revised estimate for updated production line shutdown strategy. (Estimating)		-20.5	-25.6
Revised cost estimate due to updated procurement strategy and unit prices for Government Furnished Equipment. (Estimating)		-38.6	-46.3
Revised estimate to reflect the application of new outyear inflation indices. (Estimating)		+0.2	+0.2
Adjustment for current and prior escalation. (Support)		+0.2	+0.5
Increase in Other Support due to updated support strategy. (Support)		+28.6	+32.6
Increase in Initial Spares to support fielding of the APR-39D(V)2. (Support)		+2.9	+3.6
Procurement Subtotal		-159.9	-201.4

## Contracts

### Contract Identification

**Appropriation:** Procurement  
**Contract Name:** H-1 Upgrades Production Contract Lot 14  
**Contractor:** Bell Helicopter Textron  
**Contractor Location:** 600 E. Hurst Blvd  
 Hurst, TX 76053  
**Contract Number:** N00019-16-C-0003/14  
**Contract Type:** Fixed Price Incentive(Firm Target) (FPIF)  
**Award Date:** March 14, 2016  
**Definitization Date:** February 08, 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
55.9	55.9	25	517.7	527.9	27	500.1	508.8

### Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of Advance Procurement of long lead items and contract definitization. Lot 14 includes one FY 2016 funded aircraft. Increase is due to addition of two AH-1Z aircraft in November 2017.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/13/2020)	+11.3	-6.9
Previous Cumulative Variances	+2.9	-21.2
Net Change	+8.4	+14.3

### Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to recovery for several parts that were previously late to baseline.

The favorable net change in the schedule variance is due to recovery for several parts that were previously late to baseline.

### Notes

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



**Contract Identification**

**Appropriation:** Procurement  
**Contract Name:** H-1 Upgrades Production Contract Lot 15  
**Contractor:** Bell Helicopter Textron, Inc.  
**Contractor Location:** 600 E Hurst Blvd  
 Hurst, TX 76053  
**Contract Number:** N00019-17-C-0030/15  
**Contract Type:** Fixed Price Incentive(Firm Target) (FPIF)  
**Award Date:** February 07, 2017  
**Definitization Date:** August 23, 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
49.1	N/A	22	556.2	565.6	29	537.7	556.2

**Target Price Change Explanation**

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of Advance Procurement of long lead items and contract definitization of Lot 15.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/13/2020)	+4.8	-8.4
Previous Cumulative Variances	+0.6	+6.6
Net Change	+4.2	-15.0

**Cost and Schedule Variance Explanations**

The favorable net change in the cost variance is due to material price variance on several parts.

The unfavorable net change in the schedule variance is due to parts being late to the baseline schedule.



**Contract Identification**

**Appropriation:** Procurement  
**Contract Name:** H-1 Upgrades Production Contract Lot 16  
**Contractor:** Bell Helicopter Textron  
**Contractor Location:** 600 E. Hurst Blvd  
Hurst, TX 76053  
**Contract Number:** N00019-17-C-0030/16  
**Contract Type:** Fixed Price Incentive(Firm Target) (FPIF)  
**Award Date:** January 18, 2019  
**Definitization Date:**

Contract Price								
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)		
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager	
37.6	N/A	18	716.8	739.3	37	700.0	700.0	

**Target Price Change Explanation**

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the award of Advance Procurement of long lead items and contract definitization of Lot 16; including (7) additional aircraft for domestic and (12) additional aircraft for Bahrain.

Contract Variance			
Item	Cost Variance		Schedule Variance
Cumulative Variances To Date (1/13/2020)	+0.2		+2.3
Previous Cumulative Variances	--		--
Net Change	+0.2		+2.3

**Cost and Schedule Variance Explanations**

The favorable cumulative cost variance is due to parts being ahead of the baseline schedule

The favorable cumulative schedule variance is due to parts being ahead of the baseline schedule

**Notes**

Lot 16 was awarded as an option under the Lot 15 contract.

## Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	4	4	4	100.00%
Production	293	293	349	83.95%
Total Program Quantity Delivered	297	297	353	84.14%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	12276.7	Years Appropriated	25
Expended to Date	11282.0	Percent Years Appropriated	83.33%
Percent Expended	91.90%	Appropriated to Date	12267.6
Total Funding Years	30	Percent Appropriated	99.93%

The above data is current as of January 30, 2020.

### Notes

Program of Record remains 349 aircraft.



## Operating and Support Cost

### Cost Estimate Details

<b>Date of Estimate:</b>	February 03, 2020
<b>Source of Estimate:</b>	POE
<b>Quantity to Sustain:</b>	349
<b>Unit of Measure:</b>	Aircraft
<b>Service Life per Unit:</b>	30.00 Years
<b>Fiscal Years in Service:</b>	FY 2007 - FY 2051

The program of record for H-1 Upgrades is 349 production aircraft. This quantity is reflected in the O&S cost estimate. The four development aircraft are EMD assets that are not assigned to the fleet and will not be sustained.

2019 inflation rates are included in this estimate.

PB 2020 Flight Hour controls are used in this estimate. H-1 Procurement Profile: 189 AH-1Z, 160 UH-1Y.

H-1 Primary Aircraft Authorization profile: 145 AH-1Z, 119 UH-1Y which does not include test assets. Combined squadrons are composed of 15 AH-1Z and 12 UH-1Y aircraft. A total of 5 UH-1Y aircraft have been stricken to date. The role of the remaining 80 aircraft that are not part of the Primary Aircraft Authorization profile is to allow for scheduled and unscheduled depot level maintenance, modifications, inspections, repairs, and attrition without reduction of aircraft available for the assigned mission.

The life cycle includes a 30-year service life with an average annual usage of 296.4 flight hours per AH-1Z aircraft and an average annual usage of 224.4 flight hours per UH-1Y aircraft. The life cycle includes a total of 8,105 operating aircraft years derived from the Primary Authorized Aircraft from the latest Aircraft Program Data File and a manual squadron ramp down based on attrition and the estimated service life.

Each aircraft has a designed fatigue life of 10,000 hours per aircraft.

Average attrition rate is 0.7% for AH-1Z and UH-1Y.

Average pipeline rate is 7.2% for AH-1Z and UH-1Y.

Maintenance Costs consisting of Aviation Depot Level Repairable and Consumables are estimated using a bottoms-up model, utilizing historical costs and demand rates for both the UH-1Y and AH-1Z.

O&S cost estimate is based on three levels of organic maintenance with chargeable manning (fleet squadron) estimated at 100%.

### Sustainment Strategy

The sustainment strategy for H-1 Upgrade aircraft is based on three major tenets: 1) ensuring Organizational maintenance capability is optimized and that the Program Office aggressively addresses Fleet readiness issues, 2) ensuring planned Intermediate level maintenance capability is established and expanded based on approved Business Case Analysis (BCAs), and 3) ensuring organic Depot level capability, for core components, is established by focusing on components that have the greatest impact on Fleet readiness first. These three tenets are outlined in a Program Office Playbook that identifies major efforts the Program Office is implementing in support of improving Fleet readiness and sustaining the H-1 Upgrade aircraft. Detailed Plan of Action and Milestones (POA&Ms) exist for each effort and are



monitored through internal Program Office reviews and other external meetings to ensure they remain on schedule. Finally, the tenets of the H-1 Sustainment Strategy represent a combination of tactical and strategic solutions. The strategic solutions include a series of outcome based strategic solutions, supported by long-term performance based contracts to include a Captains of Industry and component Performance Based Logistics (PBL) contracts with Bell Helicopter and other key vendors. These strategic solutions are designed to improve readiness, reduce the cost per flight hour, and transition from transactional to out-come based arrangements and are foundational to the H-1 Sustainment Strategy.

#### Antecedent Information

The H-1 antecedent estimate is a composite of AH-1W and UH-1N series aircraft. Cost per aircraft is the combined three-year (FY 2007 - FY 2009) average of costs reported in the Naval Visibility and Management of Operating and Support Costs Aviation Type Model Series Report database. Manpower for antecedent and upgrade aircraft are set equal as the table of organization is deemed to be equivalent. Antecedent aircraft have historically flown 21.7 flight hours per month and 260 flight hours annually. The UH-1N aircraft began retiring in FY 2010.

Annual O&S Costs BY2008 \$M			
Cost Element	H-1 Upgrades		UH-1N/AH-1W (Antecedent)
	Average Annual Cost Per Aircraft		Average Annual Cost Per Aircraft
Unit-Level Manpower	1.153		1.167
Unit Operations	0.402		0.230
Maintenance	1.426		1.510
Sustaining Support	0.096		0.110
Continuing System Improvements	0.196		0.340
Indirect Support	0.577		0.530
Other	0.000		0.000
Total	3.850		3.887

Item	Total O&S Cost \$M			
	H-1 Upgrades			UH-1N/AH-1W (Antecedent)
	Current Production APB Objective/Threshold	Current Estimate		
Base Year	33301.8	36632.0	31200.9	31597.8
Then Year	0.0	N/A	48819.4	N/A

#### Equation to Translate Annual Cost to Total Cost

H-1 Upgrades Average Annual Cost Per Aircraft = Total O&S Cost (BY) / Total Operating Aircraft Years.

\$3.850 M Per Year Per Aircraft = \$31,200.9M / 8,105 Total Operating Aircraft Years.

O&S Cost Variance		
Category	BY 2008 \$M	Change Explanations

Prior SAR Total O&S Estimates - Dec 2018 SAR	31374.2	
Programmatic/Planning Factors	-93.4	Updated attrition, flight hour usage rates, and authorized aircraft allocations.
Cost Estimating Methodology	0.0	
Cost Data Update	-18.3	Updated AFM O-level to I-level cost percentage and depot repair costs.
Labor Rate	-61.6	Incorporated FY 2020 Military Composite Pay Rates and updated depot labor rates.
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	-173.3	
Current Estimate	31200.9	

#### Disposal Estimate Details

**Date of Estimate:** February 03, 2020  
**Source of Estimate:** POE  
**Disposal/Demilitarization Total Cost (BY 2008 \$M):** 80.5