



Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-424



MQ- 9 Reaper Unmanned Aircraft System (MQ-9 Reaper)

As of FY 2019 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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

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Sensitivity Originator

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Common Acronyms and Abbreviations for MDAP Programs

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

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

Program Information

Program Name

MQ- 9 Reaper Unmanned Aircraft System (MQ-9 Reaper)

DoD Component

Air Force

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References

SAR Baseline (Production Estimate)

FY 2011 President's Budget dated February 1, 2010

Approved APB

Component Acquisition Executive (CAE) Approved Acquisition Program Baseline (APB) dated April 21, 2017

Mission and Description

Mission:

The MQ-9 Reaper is an armed, multi-mission, medium-altitude, long-endurance remotely piloted aircraft that is employed primarily against dynamic execution targets and secondarily as an intelligence collection asset. Given its significant loiter time, wide-range sensors, multi-mode communications suite, and precision weapons, it provides a unique capability to perform strike, coordination, and reconnaissance against high-value, fleeting, and time-sensitive targets. MQ-9s can also perform the following missions and tasks: intelligence, surveillance, reconnaissance, (ISR) close air support, combat search and rescue, precision strike, buddy-laser designation, convoy/raid overwatch, target development, and terminal air guidance. The MQ-9's capabilities make it uniquely qualified to conduct a wide variety of warfare operations in support of combatant commander objectives.

Description:

The MQ-9 baseline system carries the Multi-Spectral Targeting System (MTS), which has a robust suite of visual sensors for targeting. The MQ-9's MTS-B integrates an infrared sensor, color/monochrome daylight TV camera, image-intensified TV camera, laser range finder/designator, and a laser illuminator. The full-motion video from each of the imaging sensors can be viewed as separate video streams or fused.

The MTS unit also incorporates a laser range finder/designator, which precisely designates targets for employment of laser-guided munitions, such as the Guided Bomb Unit-12 Paveway II. The MQ-9 is also equipped with a Synthetic Aperture Radar that provides high resolution imagery, moving target indicator tracking, and targeting for GPS-guided munitions through cloud cover. The MQ-9 can also employ four laser-guided, Air-to-Ground Missile-114 Hellfire missiles, which provide highly accurate, low-collateral damage, anti-armor and anti-personnel engagement capabilities.

An Extended Range (ER) MQ-9 variant was fielded during 2015 in response to an Air Force urgent operational need. The ER variant provides a tremendous capability increase in both range and endurance, and was delivered to operational users within 18 months of receipt of the user requirement. A MQ-9 can be transformed into a MQ-9 ER through the integration of a field-retrofit modification package significantly extending the aircraft's maximum endurance. MQ-9's original external payload carriage configuration remains unchanged, providing the aircraft with a "mix and match" capability that allows it to carry both fuel tanks and an assortment of external payloads.

In its secondary role as an ISR asset, the MQ-9 is part of a system that supports strike aircraft and ground commanders by acquiring and tracking dynamic targets or other useful intelligence. It is also capable of supporting a wide range of operations such as coastal and border surveillance, weapons tracking, embargo enforcement, humanitarian/disaster assistance, support of peacekeeping and counter-narcotic operations. Utilizing satellite communication links, the remotely piloted aircraft (RPA) can acquire and pass real-time imagery data to ground users around the clock, and beyond-line-of-sight (BLOS).

The RPA can be disassembled and loaded into a single container for deployment worldwide. The entire system can be transported in the C-130 Hercules, or larger aircraft. The MQ-9 aircraft operates from standard U.S. airfields with clear line-of-sight to the ground data terminal antenna, which provides line-of-sight communications for takeoff and landing. The Predator Primary Satellite Link provides over-the-horizon communications for the aircraft and sensors.

The primary concept of operations, remote split operations, employs a launch-and-recovery ground control station for take-off and landing operations at the forward operating location, while the crew based in continental United States executes command and control of the remainder of the mission via BLOS. Remote split operations result in a smaller number of personnel deployed to a forward location, consolidate control of the different flights in one location and, as such, simplify command and control functions as well as the logistical supply challenges for the weapon system.

Executive Summary

Program Highlights Since Last Report

As of December 2017, the Air Force has contracted with General Atomics Aeronautical Systems, Incorporated (GA-ASI) for a total of 326 MQ-9 Reaper Unmanned Aircraft Systems (MQ-9s). Contracts are in work for the 107 remaining MQ-9s that will total the 395 MQ-9 Reapers (195 Block 1s and 238 Block 5s). Additionally, the MQ-9 has flown over 1.6 million cumulative flight hours as of December 31, 2017. This SAR is based on the FY 2019 PB for this MDAP.

From January 2017 through December 31, 2017, MQ-9 amassed over 325,000 total flight hours, with 91% of those hours flown in support of combat operations. MQ-9 remains one of the most called-upon warfighter combat assets.

During FY 2015, the Program Office (PO) successfully completed the initial acquisition of the Extended Range (ER) MQ-9. ER MQ-9 provides extended endurance over the current MQ-9 configuration, which allows for increased time on station and/or mission radius. All of the initial ER MQ-9 aircraft were delivered on schedule. The more recent ER Follow-On contract effort is in the process of procuring and installing ER kits on the remaining MQ-9 Block 1 fleet. The MQ-9 Block 5 contract to retrofit aircraft with ER is in work with a planned award in April 2018.

The Air Force Service Acquisition Executive approved the *MQ-9 Hybrid Acquisition Strategy Annex* to the MQ-9 Acquisition Strategy in April, 2015. This strategy blends the characteristics of a Quick Reaction Capability acquisition program with the rigor of a classic DoD acquisition program to rapidly field advanced capabilities that enable warfighter mission flexibility. A rapid early 2016 contract award has resulted in streamlined development, integration, and test so that warfighting customers will receive these advanced MQ-9 capabilities more rapidly than ever. The next capability release is already underway with plans to start fielding ER, Wiring for Wing Stations 1&7 and Payload Multiplexing in late CY 2018.

Air Force Special Operations Command (AFOTEC) completed MQ-9 Block 5 system Follow-on Test & Evaluation (FOT&E) activities during CY 2016, and published the final FOT&E report by early CY 2017. All Air Combat Command (ACC)-required test deficiencies were corrected to enable rapid MQ-9 Block 5 fielding. ACC has already direct fielded MQ-9 Block 5 assets in support of deployment requirements and users are reporting positive results on MQ-9 Block 5's operational handling and performance. The MQ-9 team continues close collaboration with operational customers to correct additional FOT&E issues and assure required Block 5 weapon system deliveries and performance.

Based on operational users' requests, the MQ-9 PO investigated the possibility of going to a single MQ-9 software strategy for ACC and Air Force Special Operations Command (AFSOC) MQ-9 fleets. This single software approach minimizes software configurations and complexity for operators and maintainers while delivering improved MQ-9 capabilities every 6-12 months. During January 2018, the MQ-9 team awarded the initial contract to accelerate the initial issuance of MQ-9 single software to both ACC and AFSOC with plans to start fielding capabilities in late CY 2018.

Based on an ACC request, the MQ-9 PO investigated the possibility of going to a single Operational Flight Program (OFP) for both ACC and AFSOC MQ-9 fleets. A single OFP would minimize software configurations and complexity for operators and maintainers. An Air Force Urgent Operational Need (UON) has been approved for the ACC Block 5 MQ-9 Extended Range, Beyond-Line-of-Site, and Barrett Asymmetric Digital Datalink Computer capability upgrades. New Start authority for these capability upgrades has been staffed through the Assistant Secretary of the Air Force for Financial Management (Budget), the General Counsel, and the Office of the Secretary of Defense. The New Start package was submitted to the Congress in November 2017 in compliance with the required 30-day Congressional notification process. On January 4, 2018, the MQ-9 team issued the 3010 Single OFP Undefined Contractual Action, and intends to have it definitized by April 2018.

The Block 50 Ground Control Station (GCS) successfully completed Critical Design Review in May 2017. Contractor Test, which includes Software Integration Lab, ground, and flight testing, began in October 2017 and is expected to end in early CY 2019. Government Developmental Test (DT) is expected to start after Contractor Test and complete in early CY 2020.

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
4th Quarter FY 2001	In response to the Global War on Terrorism (GWOT), the Air Force (AF) requested Congressional support for additional MQ-1 Predator assets and improvements, including the development of the MQ-9 Reaper, then referred to as the Predator B. This request was supported through the appropriation of the Defense Emergency Response Fund (DERF) in 2001.
2nd Quarter FY 2002	The Secretary of the Air Force and Chief of Staff of the Air Force (AF) provided direction for the MQ-9 to senior AF acquisition, requirements, and operations leaders. The AF's leaders were directed to investigate near-term solutions. The DERF provided funding for initial Predator B aircraft. Subsequently, the AF received Congressional approval to proceed with production efforts and procurement of all aircraft in a turbo-prop configuration.
1st Quarter FY 2003	The AF awarded a development contract to General Atomics Aeronautical Systems Incorporated (GA-ASI) to provide engineering drawings, full documentation of the manufacturing process, additional equipment integration of sensor components, and a plan for the MIL-STD-1760 Stores Management System.
1st Quarter FY 2004	In response to a request from the Congress, the AF submitted a report to the Congress that addressed the operational requirement for the Predator B, as well as a development and acquisition plan for achieving that operational requirement. The AF requested investment and sustainment funding for the initiation of a Predator B program based on established user requirements. As a result of the current operational needs of that time, the AF decided to develop and test the Predator B so as to understand its capabilities and limitations prior to making a full-rate production decision.
January 2004	The program received its Milestone B decision, and was approved to proceed into the Engineering and Manufacturing Development phase of acquisition.
March 2005	Award of the Predator B System Development and Demonstration (SDD) contract was approved.
2nd Quarter FY 2006	Award of the FY2005 production contract and the associated procurement funding were authorized by Congress. The Commander of Air Combat Command (ACC) issued a Predator B Early Fielding Decision. A Memorandum of Understanding between ACC and the Commander of the Aeronautical Systems Center was signed, accelerating the effort to move the initial Predator B combat capability configuration from development to production, delivery, and operations. By July 2006, acquisition management responsibility moved to the Predator-Reaper Aeronautical Systems Squadron (658 th AESS). In the fall of 2006, the AF officially designated the Predator B as the MQ-9 Reaper.
4th Quarter FY 2007	Award of the production contracts for the FY2006/FY2007 buys and the associated procurement funding were authorized by Congress. By July 2007, the 658 th AESS was designated the 703 rd Aeronautical Systems Group (AESG). The first early fielding MQ-9 aircraft was delivered to the AF and the first MQ-9 Reaper combat air patrol (CAP) was stood-up by ACC in September 2007. The second MQ-9 operational CAP was stood-up in September 2007.
2nd Quarter FY 2008	Award of the production contract for the FY 2008 buy and the associated procurement funding were authorized by the Congress. Early MQ-9 fielding was completed.
2nd Quarter FY 2009	USD(AT&L) designated the MQ-9 Reaper as a Special Interest Program, which designated the program as an Acquisition Category ID (ACAT ID) OSD oversight program. The Air Force's Major Defense Acquisition Program list officially designated the MQ-9 Reaper as an ACAT ID program.
1st Quarter FY 2010	The Program Office (PO) conducted both the Preliminary and Critical Design Reviews (PDR/CDR) on the Reaper Block 5. This stabilized the Block 5 design and began the integration and test phase of the program. The AF Technical Airworthiness Authority signed the MQ-9 Reaper

	establishing the initial airworthiness certification basis for the MQ-9 Reaper Block 1 system.
3rd Quarter FY 2012	The PO reported a Military Construction (MILCON) appropriation breach. The MILCON appropriation breach was due to the FY 2014 PB adding \$20M for the sand-up of a weapons school.
May 2012	The MQ-9 Reaper Block 5 aircraft conducted first flight.
June 2012	The MQ-9 Reaper program met the Required Assets Available (RAA) milestone.
November 2012	The Under Secretary of the Defense for Acquisition, Technology and Logistics (USD(AT&L)) signed an Acquisition Decision Memorandum which approved Milestone C for the MQ-9 Reaper Increment I, Block 5 program and authorized entry into Low Rate Initial Production.
May 2013	The PO reported a schedule breach for the FOT&E and Full Rate Production (FRP) milestones. The FOT&E and FRP schedule breaches were due to the realized risks such as software maturity, quality of technical orders and flight test delays. The schedule breach delayed the fielding of 904.6 operational flight software, Block 5 aircraft, and Block 50 GCS.
December 2013	The Air Force Review Board (AFRB) and the Configuration Steering Board approved the removal of the FRP milestone and replaced it with an in Progress Review following FOT&E.
3rd Quarter FY 2014	The PO successfully executed two Joint Urgent Operational Needs (JUONs). The first was for AF Special Operations Command (AFSOC) and ACC MQ-9 Reaper systems to support rapid fielding of the Afghan Enabler capabilities. The second JUON was a requirement for MQ-9 Extended Range (ER) aircraft deliveries to users. MQ-9 ER provides an extension of range and endurance which allows for increased time-on-station and mission radius. The PO was also directed by Air Force senior leadership to develop an acquisition strategy that blends the rigor of a traditional acquisition program with the agility of a Quick Reaction Capability (QRC) program to make it more responsive to warfighter requirements. This Hybrid Acquisition Strategy is a schedule-driven process designed to rapidly field mature MQ-9 capabilities. Also, the Block 50 Ground Control Station development contract was awarded that culminated in a successful Block 50 System Requirements Review during CY2014.
March 2015	All 38 MQ-9 ER aircraft were delivered to Users on schedule.
December 2015	The Commander of ACC declared that MQ-9 Reaper Initial Operational Capability (IOC) had been achieved. The IOC declaration memorandum stated the MQ-9 Reaper has met all required IOC capabilities as outlined in the MQ-9 Increment I Capabilities Production Document.
January 2016	MQ-9 passed its 1-millionth total flight hours mark. MQ-9 remains one of the most called-upon warfighter combat assets.
3rd Quarter FY 2016	The AF Service Acquisition Executive approved the MQ-9 Reaper Hybrid Acquisition Strategy Annex to the MQ-9 Acquisition Strategy. The first procurement under this strategy was awarded in CY2016 and will upgrade the MQ-9 Block 5 weapon system with improved video, precision strike, and numerous maintenance improvements. Initial delivery of Block 5s with these capabilities to warfighters has been accelerated to begin early in CY2018.
May 2016	Block 50 Ground Control Station (GCS) completed Preliminary Design Review (PDR) and construction of the initial set of mobile GCS has been initiated in support of Block 50 GCS developmental tests.
September 2016	All MQ-9 Follow-on Operational Test and Evaluation (FOT&E) activities were completed, and the MQ-9 Acquisition Program Baseline FOT&E completion threshold was successfully met.
1st Quarter FY 2017	In November 2016, an ER Follow-On Contract was awarded which will procure and install ER kits to retrofit the full MQ-9 Block 1 fleet with ER capabilities. The PO awarded the MQ-9 Electrical Safety Improvement Program (ESIP) Follow-On Contract in December 2016 which will complete the MQ-9 Block 1 fleet ESIP upgrades. ACC requested the PO investigate a single software approach for both ACC and AFSOC to minimize fielded software configurations, reduce

complexity in the field for operators and maintainers, and rapidly deliver capabilities every 6-12 months with acceptable risk.

Threshold Breaches

APB Breaches

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

Explanation of Breach

The MILCON APPN breach was previously reported in the December 2012 SAR.

Nunn-McCurdy Breaches

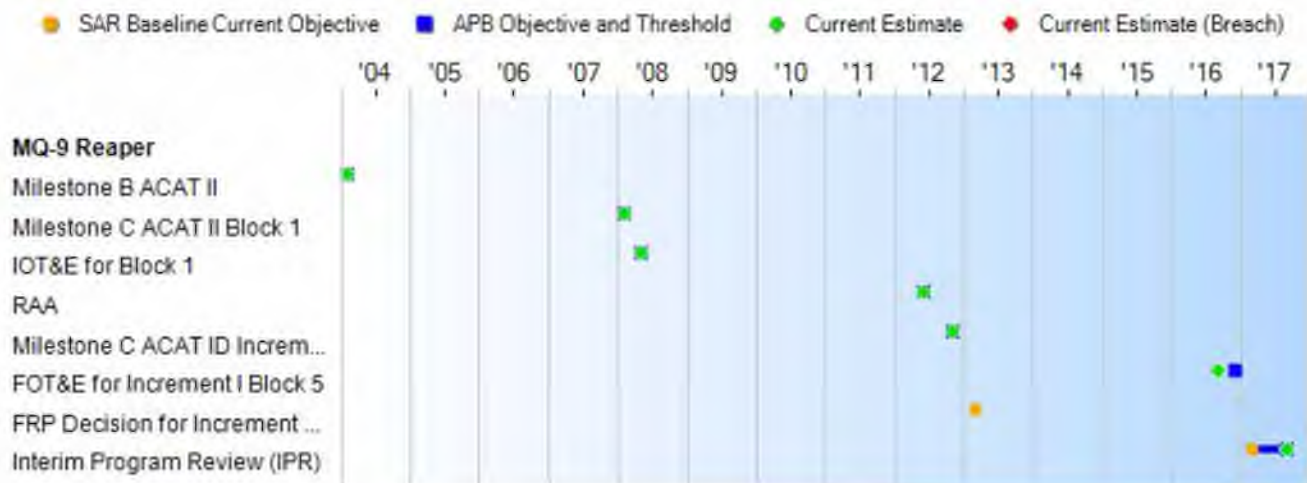
Current UCR Baseline

PAUC	None
APUC	None

Original UCR Baseline

PAUC	None
APUC	None

Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Milestone B ACAT II	Feb 2004	Feb 2004	Feb 2004	Feb 2004
Milestone C ACAT II Block 1	Feb 2008	Feb 2008	Feb 2008	Feb 2008
IOT&E for Block 1	May 2008	May 2008	May 2008	May 2008
RAA	Sep 2010	Jun 2012	Jun 2012	Jun 2012
Milestone C ACAT ID Increment 1, Block 5	Mar 2011	Nov 2012	Nov 2012	Nov 2012
FOT&E for Increment I Block 5	Nov 2012	Dec 2016	Dec 2016	Sep 2016
FRP Decision for Increment I Block 1 and 5	Mar 2013	N/A	N/A	N/A
Interim Program Review (IPR)	N/A	Mar 2017	Sep 2017	Sep 2017

(Ch-1)

Change Explanations

(Ch-1) Interim Program Review (IPR) current estimate changed from August 2017 to September 2017 to reflect event completion.

Notes

RAA includes two fixed GCSs, two mobile GCSs, six PMAI Block 1 aircraft, technical orders, support equipment, initial and readiness spares packages, and logistics support.

The August 2013 Air Force Review Board approved the removal of the FRP milestone and it was replaced by an Interim Program Review APB Milestone. The FRP milestone was removed because the program reached maximum production rate in FY 2011. In addition, the program will already have delivered and contracted for the majority of production aircraft at the time of the baselined FRP date. FRP was deleted in the Schedule-only APB approved on April 21, 2017.

AFOTEC completed the Block 5 FOT&E activities in September 2016, providing an Interim Summary Report on October 13, 2016 and a draft final report in December 2016 to close out the APB milestone event. Subsequently, the Program Office received the final AFOTEC FOT&E report on February 3, 2017.

The IPR was completed on September 11, 2017 with an approval from SAF/IAQ.

Acronyms and Abbreviations

AFOTEC - Air Force Operational Test and Evaluation Center

FOT&E - Follow-On Test and Evaluation

GCS - Ground Control Station

IOT&E - Initial Operational Test and Evaluation

PMAI - Primary Mission Aircraft Inventory

RAA - Required Assets Available

~~(U//FOUO)~~ Performance

(U//FOUO) Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
(U//FOUO) Hunter				
The system's capability must allow a targeting solution at the weapon's maximum range.	The system's capability must allow a targeting solution at a direct attack weapon's maximum range	The system's capability must allow a targeting solution at a direct attack weapon's maximum range	DT ongoing for KPP; AFOTEC IOT&E did not evaluate KPP due to system availability. Some initial assessments were conducted in FOT&E but full KPP evaluation will be deferred to future testing	The system's capability must allow a targeting solution at a direct attack weapon's maximum range.
(U//FOUO) Killer				
System must be capable of computing a weapon's release point, passing required information, at the required accuracy, to the weapon and reliably releasing the weapon upon command.	System must be capable of computing a weapon's release point, passing required information, at the required accuracy, to the weapon and reliably releasing the weapon upon command.	System must be capable of computing a weapon's release point, passing required information, at the required accuracy, to the weapon and reliably releasing the weapon upon command.	AFOTEC IOT&E found KPP operationally effective and suitable	System must be capable of computing a weapon's release point, passing required information, at the required accuracy, to the weapon and reliably releasing the weapon upon command.
(U//FOUO) Net Ready: The system must support Net-Centric military operations. The system must be able to enter and be managed in the network, and exchange data in a secure manner to enhance mission effectiveness. The system must continuously provide survivable, interoperable, secure, and operationally effective information exchanges to enable a Net-Centric military capability.				
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	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	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 transition to Net-Centric military operations to include 1) DISR mandated GIG IT standards and profiles	JITC certification is renewed for each software update; Full capability is deferred until Block 50 GCS is fielded	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

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) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW-RM Enterprise Services 4) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW-RM Enterprise Services 4) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an IATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW-RM Enterprise Services 4) IA requirements including availability, integrity, authentication, confidentiality, and nonrepudiation, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.
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Requirements Reference

CPD dated January 29, 2007

Change Explanations

None

Acronyms and Abbreviations

AFOTEC - Air Force Operational Test and Evaluation Center
ATO - Approval to Operate
DAA - Designated Approval Authority
DISR - Department of Defense Information Technology Standards Registry
DT - Developmental Testing
FOT&E - Follow-On Operational Test and Evaluation
GCS - Ground Control Station
GIG - Global Information Grid
IA - Information Assurance
IATO - Interim Approval to Operate
IOT&E - Initial Operational Test and Evaluation
IT - Information Technology
JITC - Joint Interoperability Test Command
KIP - Key Interface Profile
NCOW-RM - Net-Centric Operations and Warfare Reference Model
PO - Program Office
TV-1 - Technical Standards Profile

Track to Budget

General Notes

Program Element 0205219F includes funds not associated with the MDAP. This report only reflects funds associated with the MDAP.

RDT&E

Appn	BA	PE	
Air Force	3600	07	0205219F
	Project	Name	
	675246	MQ-9 Development and Fielding	
Air Force	3600	07	0305205F
	Project	Name	
	674755	(Shared) (Sunk)	
Air Force	3600	07	0305219F
	Project	Name	
	675143	PREDATOR (Shared) (Sunk)	

Procurement

Appn	BA	PE	
Air Force	3010	07	0205219F
	Line Item	Name	
	000075	Other Production Charges (Shared)	
Air Force	3010	06	0205219F
	Line Item	Name	
	000999	Initial Spares (Shared)	
Air Force	3010	05	0305205F
	Line Item	Name	
	PRDT01	MQ-1 Mods (Shared) (Sunk)	
Air Force	3010	04	0305205F
	Line Item	Name	
	PRDTA1	Aircraft Procurement (Shared) (Sunk)	
Air Force	3010	04	0205219F
	Line Item	Name	
	PRDTB1	MQ-9 (Shared)	
Air Force	3010	05	0205219F
	Line Item	Name	
	PRDTB2	MQ-9 Mods (Shared)	

MILCON

Appn	BA	PE
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Air Force 3300 01 0205219F

Project	Name
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BHD000	MQ-9 Operations	(Sunk)
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KWRD143	RPA Fixed Ground Control Station Facility	
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RKMF113	Add RPA Weapons School Facility	(Sunk)
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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	778.8	1365.1	1501.6	1388.1	809.9	1488.8	1519.6
Procurement	9824.0	10175.3	11192.8	10045.0	10866.0	11765.5	11564.4
Flyaway	--	--	--	7293.2	--	--	8386.9
Recurring	--	--	--	7293.2	--	--	8386.9
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	2751.8	--	--	3177.5
Other Support	--	--	--	1100.4	--	--	1295.7
Initial Spares	--	--	--	1651.4	--	--	1881.8
MILCON	148.5	53.3	58.6	73.2 ¹	158.9	55.6	78.4
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	10751.3	11593.7	N/A	11506.3	11834.8	13309.9	13162.4

¹ APB Breach

Cost Notes

In accordance with Section 842 of the National Defense Authorization Act for FY 2017, which amended title 10 U.S.C. § 2334, the Director of Cost Assessment and Program Evaluation, and the Secretary of the military department concerned or the head of the Defense Agency concerned, must issue guidance requiring a discussion of risk, the potential impacts of risk on program costs, and approaches to mitigate risk in cost estimates for MDAPs and major subprograms. The information required by the guidance is to be reported in each SAR. This guidance is not yet available; therefore, the information on cost risk is not contained in this SAR.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	3	3	3
Procurement	388	401	433
Total	391	404	436

Quantity Notes

Procurement quantity is the number of MQ-9 Reaper aircraft. Ground Control Stations (GCS) and other equipment costs are included, but not used as a unit of measure.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2019 President's Budget / December 2017 SAR (TY\$ M)									
Appropriation	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
RDT&E	1203.7	119.8	22.8	45.7	61.0	33.0	33.6	0.0	1519.6
Procurement	7281.4	715.3	929.1	789.9	442.9	448.0	633.3	324.5	11564.4
MILCON	74.1	4.3	0.0	0.0	0.0	0.0	0.0	0.0	78.4
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2019 Total	8559.2	839.4	951.9	835.6	503.9	481.0	666.9	324.5	13162.4
PB 2018 Total	8661.0	839.4	419.3	427.0	393.4	404.5	584.1	1194.4	12923.1
Delta	-101.8	0.0	532.6	408.6	110.5	76.5	82.8	-869.9	239.3

Funding Notes

"To Complete" procurement costs in the table above primarily include retrofit costs and GCS Block 50 costs.

Quantity Summary										
FY 2019 President's Budget / December 2017 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
Development	3	0	0	0	0	0	0	0	0	3
Production	0	347	16	29	20	4	4	13	0	433
PB 2019 Total	3	347	16	29	20	4	4	13	0	436
PB 2018 Total	3	347	16	0	0	0	0	0	0	366
Delta	0	0	0	29	20	4	4	13	0	70

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
3600 RDT&E Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	7.8
2003	--	--	--	--	--	--	12.8
2004	--	--	--	--	--	--	20.9
2005	--	--	--	--	--	--	56.8
2006	--	--	--	--	--	--	10.1
2007	--	--	--	--	--	--	34.0
2008	--	--	--	--	--	--	55.9
2009	--	--	--	--	--	--	38.6
2010	--	--	--	--	--	--	102.8
2011	--	--	--	--	--	--	136.6
2012	--	--	--	--	--	--	106.7
2013	--	--	--	--	--	--	130.9
2014	--	--	--	--	--	--	103.3
2015	--	--	--	--	--	--	141.5
2016	--	--	--	--	--	--	127.7
2017	--	--	--	--	--	--	117.3
2018	--	--	--	--	--	--	119.8
2019	--	--	--	--	--	--	22.8
2020	--	--	--	--	--	--	45.7
2021	--	--	--	--	--	--	61.0
2022	--	--	--	--	--	--	33.0
2023	--	--	--	--	--	--	33.6
Subtotal	3	--	--	--	--	--	1519.6

Annual Funding								
3600 RDT&E Research, Development, Test, and Evaluation, Air Force								
Fiscal Year	Quantity	BY 2008 \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2002	--	--	--	--	--	--	--	8.9
2003	--	--	--	--	--	--	--	14.4
2004	--	--	--	--	--	--	--	22.9
2005	--	--	--	--	--	--	--	60.7
2006	--	--	--	--	--	--	--	10.5
2007	--	--	--	--	--	--	--	34.4
2008	--	--	--	--	--	--	--	55.4
2009	--	--	--	--	--	--	--	37.8
2010	--	--	--	--	--	--	--	99.4
2011	--	--	--	--	--	--	--	129.6
2012	--	--	--	--	--	--	--	99.5
2013	--	--	--	--	--	--	--	120.0
2014	--	--	--	--	--	--	--	93.4
2015	--	--	--	--	--	--	--	126.7
2016	--	--	--	--	--	--	--	112.7
2017	--	--	--	--	--	--	--	101.7
2018	--	--	--	--	--	--	--	102.2
2019	--	--	--	--	--	--	--	19.1
2020	--	--	--	--	--	--	--	37.6
2021	--	--	--	--	--	--	--	49.1
2022	--	--	--	--	--	--	--	26.1
2023	--	--	--	--	--	--	--	26.0
Subtotal	3	--	--	--	--	--	--	1388.1

FY 2002 RDT&E includes \$7.8M (TY\$) of Defense Emergency Response Funds.

Annual Funding 3010 Procurement Aircraft Procurement, Air Force							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	4	60.4	--	--	60.4	--	60.4
2003	4	36.8	--	--	36.8	--	36.8
2004	5	67.7	--	--	67.7	2.8	70.5
2005	5	85.8	2.2	--	88.0	5.3	93.3
2006	2	32.2	33.0	--	65.2	44.7	109.9
2007	12	109.4	50.6	--	160.0	151.6	311.6
2008	28	214.2	51.7	--	265.9	80.5	346.4
2009	24	212.3	138.4	--	350.7	186.4	537.1
2010	24	263.8	24.1	--	287.9	245.6	533.5
2011	48	429.8	51.9	--	481.7	140.3	622.0
2012	48	515.4	177.8	--	693.2	211.6	904.8
2013	39	583.2	145.4	--	728.6	150.5	879.1
2014	23	281.4	69.1	--	350.5	124.0	474.5
2015	24	411.0	101.4	--	512.4	166.8	679.2
2016	33	546.7	198.8	--	745.5	205.9	951.4
2017	24	386.9	115.1	--	502.0	168.9	670.9
2018	16	365.5	123.4	--	488.9	226.4	715.3
2019	29	516.8	170.3	--	687.1	242.0	929.1
2020	20	306.2	236.9	--	543.1	246.8	789.9
2021	4	107.4	183.1	--	290.5	152.4	442.9
2022	4	87.1	205.5	--	292.6	155.4	448.0
2023	13	230.6	213.5	--	444.1	189.2	633.3
2024	--	--	121.7	--	121.7	40.4	162.1
2025	--	--	107.5	--	107.5	35.7	143.2
2026	--	--	6.5	--	6.5	1.8	8.3
2027	--	--	4.1	--	4.1	1.3	5.4
2028	--	--	4.3	--	4.3	1.2	5.5
Subtotal	433	5850.6	2536.3	--	8386.9	3177.5	11564.4

Annual Funding							
3010 Procurement Aircraft Procurement, Air Force							
Fiscal Year	Quantity	BY 2008 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	4	68.0	--	--	68.0	--	68.0
2003	4	40.8	--	--	40.8	--	40.8
2004	5	73.1	--	--	73.1	3.0	76.1
2005	5	90.0	2.3	--	92.3	5.6	97.9
2006	2	32.9	33.7	--	66.6	45.7	112.3
2007	12	108.9	50.4	--	159.3	150.9	310.2
2008	28	209.8	50.6	--	260.4	79.0	339.4
2009	24	204.5	133.4	--	337.9	179.5	517.4
2010	24	249.3	22.8	--	272.1	232.2	504.3
2011	48	399.8	48.3	--	448.1	130.5	578.6
2012	48	472.3	162.9	--	635.2	194.0	829.2
2013	39	524.0	130.7	--	654.7	135.2	789.9
2014	23	249.4	61.2	--	310.6	110.0	420.6
2015	24	359.8	88.8	--	448.6	146.0	594.6
2016	33	470.7	171.2	--	641.9	177.3	819.2
2017	24	327.4	97.3	--	424.7	143.0	567.7
2018	16	302.9	102.3	--	405.2	187.7	592.9
2019	29	420.1	138.4	--	558.5	196.8	755.3
2020	20	244.1	188.8	--	432.9	196.7	629.6
2021	4	83.9	143.1	--	227.0	119.1	346.1
2022	4	66.7	157.5	--	224.2	119.0	343.2
2023	13	173.2	160.3	--	333.5	142.1	475.6
2024	--	--	89.7	--	89.7	29.7	119.4
2025	--	--	77.6	--	77.6	25.8	103.4
2026	--	--	4.6	--	4.6	1.3	5.9
2027	--	--	2.8	--	2.8	0.9	3.7
2028	--	--	2.9	--	2.9	0.8	3.7
Subtotal	433	5171.6	2121.6	--	7293.2	2751.8	10045.0

FY 2002 Procurement includes \$29.1M (TY\$) of Defense Emergency Response Funds.

End Item Recurring Flyaway related costs include aircraft, Multi-spectral Targeting System-B (MTS-B) and government furnished equipment, as well as retrofit costs associated with aircraft and MTS-B.

Non End Item Recurring Flyaway costs include retrofit, GCS and communications. Retrofits include GCS and other miscellaneous communications and sensor retrofits.

Cost Quantity Information		
3010 Procurement Aircraft Procurement, Air Force		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2008 \$M
2002	4	68.1
2003	4	41.4
2004	5	74.0
2005	5	90.7
2006	2	33.3
2007	12	125.1
2008	28	226.1
2009	24	204.0
2010	24	223.0
2011	48	411.0
2012	48	502.1
2013	39	594.1
2014	23	328.3
2015	24	361.3
2016	33	476.6
2017	24	338.9
2018	16	217.9
2019	29	362.9
2020	20	216.0
2021	4	52.5
2022	4	52.8
2023	13	171.5
2024	--	--
2025	--	--
2026	--	--
2027	--	--
2028	--	--
Subtotal	433	5171.6

Annual Funding 3300 MILCON Military Construction, Air Force		
Fiscal Year	TY \$M	
	Total Program	
2009		44.5
2010		2.7
2011		8.4
2012		--
2013		--
2014		18.5
2015		--
2016		--
2017		--
2018		4.3
Subtotal		78.4

Annual Funding 3300 MILCON Military Construction, Air Force		
Fiscal Year	BY 2008 \$M	
	Total Program	
2009		43.0
2010		2.6
2011		7.8
2012		--
2013		--
2014		16.3
2015		--
2016		--
2017		--
2018		3.5
Subtotal		73.2

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	11/21/2012	11/21/2012
Approved Quantity	48	62
Reference	Milestone C ADM	Milestone C ADM
Start Year	2013	2013
End Year	2014	2014

The Current Total LRIP Quantity is more than 10% of the total production quantity due to Congressional approval to procure 39 Block 5 aircraft in FY 2013 and 23 in FY 2014. The change from the initial LRIP quantity to current LRIP quantity is due to 14 aircraft added to the FY 2013 and FY 2014 profile; eight aircraft added by Congress in FY 2014 and approval to purchase six additional aircraft based on budget.

The MQ-9 Reaper program was broken into two blocks; Block 1 aircraft, providing initial capability to meet the early fielding directed by Congress, and Block 5 aircraft which provides additional power, a redesigned avionics bay, and encrypted communications. The program procured 195 Block 1 aircraft prior to the planned procurement of 171 Block 5 aircraft starting in FY 2013. The LRIP quantities reported in the table above reflect the procurement of Block 5 aircraft only.

~~(U//FOUO)~~ Foreign Military Sales~~(U//FOUO)~~

Country	Date of Sale	Quantity	Total Cost \$M	Description
United Kingdom	3/22/2017	0	5.0	FMS case UK-D-VAC provides funding for major modifications of the UK Mobile Ground Control Station (MGCS) and the MQ-9 aircraft, upgrading them with High Definition capability
United Kingdom	1/30/2017	16	423.4	FMS case UK-D-SAC provides funding for 16 Certifiable Predator B aircraft in the UK Protector Configuration, 7 GCS, and assorted support equipment
France	11/15/2016	3	104.4	FMS case FR-D-SAD provides funding for three MQ-9 Block5 aircraft and one MGCS, and assorted support equipment
United Kingdom	6/30/2016	0	18.2	FMS case UK-D-GBI provides funding for manpower only in support of the start up of the UK Protector Program.
Spain	12/21/2015	0	5.8	FMS case SP-D-GAI provides funding for studies and site surveys for airworthiness certifications.
Spain	12/21/2015	4	168.3	FMS case SP-D-SAA provides funding for four MQ-9 Reaper Block 5 aircraft, two Mobile Ground Control Stations (MGCS), various support equipment, and Contractor Logistics Support (CLS).
France	12/7/2015	0	5.7	FMS case FR-D-GAI provides funding for technical assistance support of the MQ-9 Reaper Block 5 aircraft, for Tech Assistance support, and for airworthiness certifications.
France	12/7/2015	6	229.1	FMS case FR-D-SAC provides funding for six MQ-9 Block 5 aircraft, two MGCS, and assorted support equipment.
United Kingdom	11/12/2015	0	103.1	FMS case UK-D-QBQ provides funding for CLS.
United Kingdom	12/10/2014	0	106.2	FMS case UK-D-GAY provides funding for CLS.
Netherlands	9/30/2014	0	3.1	FMS case NE-D-GAO provides funding for airworthiness certification as well as a site survey.
Germany	12/26/2013	0	1.0	FMS case GY-D-GAX provides funding for airworthiness documents, manpower, and travel.
France	8/9/2013	3	345.3	FMS case FR-D-STE provides funding for the purchase of three aircraft, one MGCS, CLS, and support equipment.
United Kingdom	11/10/2011	5	70.1	FMS case UK-D-SMK provides funding for the purchase of five aircraft, four MGCSs, and assorted sensors and support equipment.
Italy	11/20/2008	6	221.4	FMS case IT-D-SAG provides funding for the purchase of six aircraft, three MGCSs, CLS, and assorted support equipment.
United Kingdom	10/4/2007	4	69.1	FMS case UK-D-SMJ provides funding for the purchase of four aircraft, one MGCS, and spares.

MQ-9 Reaper

December 2017 SAR

United Kingdom	2/14/2007	2	374.9	FMS case UK-D-SMI provides funding for the purchase of two aircraft, two MGCSs, CLS, and assorted support equipment.
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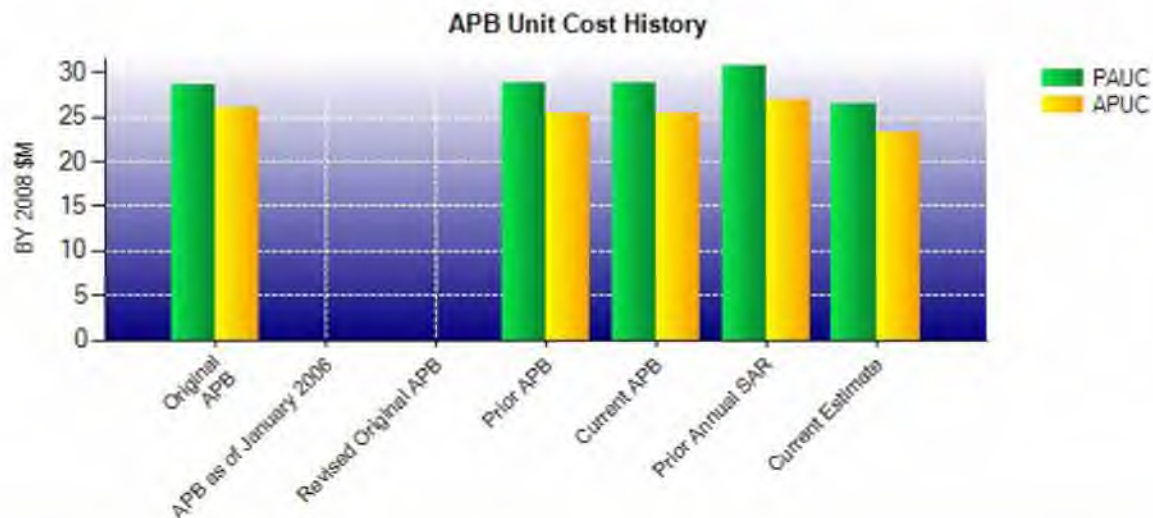
Notes**Nuclear Costs**

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2008 \$M	BY 2008 \$M	% Change
	Current UCR Baseline (Apr 2017 APB)	Current Estimate (Dec 2017 SAR)	
Program Acquisition Unit Cost			
Cost	11593.7	11506.3	
Quantity	404	436	
Unit Cost	28.697	26.391	-8.04
Average Procurement Unit Cost			
Cost	10175.3	10045.0	
Quantity	401	433	
Unit Cost	25.375	23.199	-8.58
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2008 \$M	BY 2008 \$M	% Change
	Original UCR Baseline (Feb 2012 APB)	Current Estimate (Dec 2017 SAR)	
Program Acquisition Unit Cost			
Cost	11541.3	11506.3	
Quantity	404	436	
Unit Cost	28.568	26.391	-7.62
Average Procurement Unit Cost			
Cost	10402.1	10045.0	
Quantity	401	433	
Unit Cost	25.940	23.199	-10.57

The FY 2019 PB increased the number of aircraft from the revised 366 to 436. The additional aircraft is driving the decrease in PAUC and APUC.



APB Unit Cost History					
Item	Date	BY 2008 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Feb 2012	28.568	25.940	32.396	29.604
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Dec 2012	28.697	25.375	32.945	29.340
Current APB	Apr 2017	28.697	25.375	32.945	29.340
Prior Annual SAR	Dec 2016	30.647	26.938	35.309	31.277
Current Estimate	Dec 2017	26.391	23.199	30.189	26.708

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
30.268	0.155	-1.332	0.573	2.052	-4.319	0.000	2.792	-0.079	30.189

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
28.005	0.177	-1.105	0.382	0.834	-4.469	0.000	2.884	-1.297	26.708

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	N/A	Feb 2004	Feb 2004
Milestone C	N/A	N/A	Feb 2008	Feb 2008
IOC	N/A	N/A	Sep 2010	Jun 2012
Total Cost (TY \$M)	N/A	N/A	11834.8	13162.4
Total Quantity	N/A	N/A	391	436
PAUC	N/A	N/A	30.268	30.189

The Milestone C schedule event above reflects the ACAT II Block 1 Milestone C decision. On November 21, 2012 the USD (AT&L) signed an ADM approving the ACAT ID Increment 1, Block 5 Milestone C and delegating MDA to the Air Force.

The April 2017 APB was a schedule only APB. It did not include any cost changes. The PAUC and APUC associated with the April 2017 APB was from the December 2012 APB.

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	809.9	10866.0	158.9	11834.8
Previous Changes				
Economic	-10.7	+112.8	+4.2	+106.3
Quantity	--	-443.0	--	-443.0
Schedule	+30.2	+165.6	--	+195.8
Engineering	+530.1	+427.2	+3.2	+960.5
Estimating	+163.1	-850.5	-87.9	-775.3
Other	--	--	--	--
Support	-31.3	+1075.3	--	+1044.0
Subtotal	+681.4	+487.4	-80.5	+1088.3
Current Changes				
Economic	-2.6	-36.2	--	-38.8
Quantity	--	+1224.3	--	+1224.3
Schedule	+54.1	--	--	+54.1
Engineering	--	-66.0	--	-66.0
Estimating	-23.2	-1084.6	--	-1107.8
Other	--	--	--	--
Support	--	+173.5	--	+173.5
Subtotal	+28.3	+211.0	--	+239.3
Total Changes	+709.7	+698.4	-80.5	+1327.6
Current Estimate	1519.6	11564.4	78.4	13162.4

Summary BY 2008 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	778.8	9824.0	148.5	10751.3
Previous Changes				
Economic	--	--	--	--
Quantity	--	-321.5	--	-321.5
Schedule	+24.3	+54.7	-0.1	+78.9
Engineering	+457.5	+270.5	+2.7	+730.7
Estimating	+132.0	-869.8	-77.9	-815.7
Other	--	--	--	--
Support	-27.3	+820.5	--	+793.2
Subtotal	+586.5	-45.6	-75.3	+465.6
Current Changes				
Economic	--	--	--	--
Quantity	--	+969.3	--	+969.3
Schedule	+42.1	--	--	+42.1
Engineering	--	-55.9	--	-55.9
Estimating	-19.3	-792.8	--	-812.1
Other	--	--	--	--
Support	--	+146.0	--	+146.0
Subtotal	+22.8	+266.6	--	+289.4
Total Changes	+609.3	+221.0	-75.3	+755.0
Current Estimate	1388.1	10045.0	73.2	11506.3

Previous Estimate: December 2016

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-2.6
Schedule delays in the Blk 50 Ground Control Station (GCS) development program caused a slip from FY 2019 into FY 2023 due to system and software design maturation. (Schedule)	+42.1	+54.1
Adjustment for current and prior escalation. (Estimating)	+1.2	+1.3
Revised estimate using actual proposal costs for Blk 50 GCS. (Estimating)	+2.7	+3.0
Revised estimate using actual proposal costs for Hybrid Release 2. (Estimating)	-20.4	-24.3
Revised estimate using actual proposal costs for Hybrid Release 1 (Estimating)	-2.8	-3.2
RDT&E Subtotal	+22.8	+28.3

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-36.2
Quantity variance resulting from an increase of 70 Block 5 MQ-9s from 363 to 433. (Quantity)	+969.3	+1224.3
Reduced funding due to the cancelation of the Block 1 to Block 5 MQ-9 retrofit program. (Estimating)	-695.7	-961.7
Reduced funding due to a reduction in number of Lynx SAR retrofits needed for the fleet. (Estimating)	-10.9	-12.6
Revised estimate due to the shift of DAS-4 retrofit program from ACAT IC to ACAT II. (Engineering)	-55.9	-66.0
Revised estimate based on a new mix of Dual Block Ground Control Stations (GCS) and Single Block GCS. (Estimating)	-61.5	-81.1
Revised estimate to account for actual proposal costs for the Extended Range (ER) Follow-on Effort and Kit and Installs. (Estimating)	-36.1	-44.1
Revised estimate due to updated models based on actual proposals and EVM data. (Estimating)	+1.9	+4.0
Adjustment for current and prior escalation. (Estimating)	+9.5	+10.9
Adjustment for current and prior escalation. (Support)	+3.5	+4.2
Decrease in Other Support to reflect actuals. (Support)	-5.7	-9.2
Increase in Initial Spares resulting from an increase of 70 aircraft. (Support) (QR)	+148.2	+178.5
Procurement Subtotal	+266.6	+211.0

(QR) Quantity Related

(U//FOUO) Contracts**(U//FOUO) Contract Identification**

Appropriation: Procurement
Contract Name: Extended Range Follow-On
Contractor: General Atomics Corporation
Contractor Location: 1420 Kirkham Way
 Poway, CA 92064
Contract Number: FA8620-15-G-4040/9
Contract Type: Cost Plus Fixed Fee (CPFF)
Award Date: November 22, 2016
Definitization Date: November 22, 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	
28.6	N/A	0	28.6	N/A	0	28.6	28.6	

Contract Variance			
Item	Cost Variance		Schedule Variance
Cumulative Variances To Date (12/31/2017)	+1.2		+0.2
Previous Cumulative Variances	--		--
Net Change	+1.2		+0.2

Cost and Schedule Variance Explanations

The favorable cumulative cost variance is due to underruns in program management, project engineering and installation. The program has not encountered significant issues during early start up and is executing more efficiently than originally planned.

The favorable cumulative schedule variance is due to underruns in program management, project engineering and installation. The program has not encountered significant issues during early start up and is executing more efficiently than originally planned.

(U//FOUO) Contract Identification

Appropriation: Procurement
Contract Name: MQ-9 Aircraft Structural Integrity Program
Contractor: General Atomics Aeronautical Systems, INC.
Contractor Location: 14200 Kirkham Way
 Poway, CA 92064
Contract Number: FA8620-10-G-3038/45
Contract Type: Cost Plus Incentive Fee (CPIF)
Award Date: June 25, 2013
Definitization Date: June 25, 2013

(U//FOUO) Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
28.3	N/A	0	82.6	N/A	0	81.2	85.2

(U//FOUO) Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to engineering change orders and contract modifications.

(U//FOUO) Contract Variance

Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2017)	-1.9	-5.1
Previous Cumulative Variances	-1.2	-2.7
Net Change	-0.7	-2.4

(U//FOUO) Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to labor underruns in Program Management, Scheduling and Finance. Resources are performing more efficiently than baselined. Additionally, phase 2 is expected to need significantly less hours of program management than originally bid.

The unfavorable net change in the schedule variance is due to flight test priorities at Gray Butte, California. Delays are likely to continue to occur throughout the flight test period as other high priority programs require urgent support.

(U//FOUO) Contract Identification

Appropriation: Procurement
Contract Name: FY15 MQ-9 Reaper Production
Contractor: General Atomics Aeronautical Systems, INC.
Contractor Location: 14200 Kirkham Way
 Poway, CA 92064
Contract Number: FA8620-15-G-4040/7
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: August 15, 2016
Definitization Date: August 15, 2016

(U//FOUO) Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
280.1	299.7	30	279.4	299.0	30	291.3	307.5

(U//FOUO) Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to changes negotiated on the Global Positioning System production cut-in proposal.

(U//FOUO) Contract Variance

Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2017)	-13.0	-21.5
Previous Cumulative Variances	0.0	+5.9
Net Change	-13.0	-27.4

(U//FOUO) Cost and Schedule Variance Explanations

The unfavorable cumulative cost variance is due to workmanship escapes on composite structures which has resulted in out-of-scope repair and rework. Material costs were higher than expected for some components and the acceleration of sustaining engineering activities for Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues have also caused a cost variance. The unfavorable cost variance is not recoverable.

The unfavorable net change in the schedule variance is due to revisions to the MRP delivery dates, which has pushed to start and completion dates of planes into the future by 1 to 10 weeks. Delayed completion will affect the start of integration for these planes but will not impact the contractual delivery dates.

(U//FOUO) Contract Identification

Appropriation: RDT&E
Contract Name: BLK 50 GCS Development (DO 89)
Contractor: General Atomics Aeronautical Systems, INC.
Contractor Location: 14200 Kirkham Way
 Poway, CA 92064
Contract Number: FA8620-10-G-3038/89
Contract Type: Cost Plus Fixed Fee (CPFF)
Award Date: April 10, 2014
Definitization Date: April 10, 2014

(U//FOUO) Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
141.4	N/A	7	141.4	N/A	7	221.5	223.6

(U//FOUO) Contract Variance

Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2017)	-13.1	-4.1
Previous Cumulative Variances	-9.3	-7.8
Net Change	-3.8	+3.7

(U//FOUO) Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to GCS Development and ASG Software. Ground Control Station (GCS) Development included the completion of the design of specific Line Replaceable Units, drawings and support for the build of GCS 1, 2, and 3. This control account has encountered significant labor overruns. Software cost overrun is driven by additional labor needed to complete subsystem reviews and safety critical separation modeling.

The favorable net change in the schedule variance is due to successful completion of tasks associated with Software Development and GCS Development.

(U//FOUO) Contract Identification

Appropriation: Procurement
Contract Name: MTS-B HD/TLA DAS-4 FY15 Production
Contractor: Raytheon Company
Contractor Location: 2501 W University Dr
 McKinney, TX 75070
Contract Number: FA8620-11-G-4050/18
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: April 25, 2016
Definitization Date: April 25, 2016

(U//FOUO) Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
81.1	84.9	39	83.8	87.5	39	84.9	89.3

(U//FOUO) Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional work scope added to contract.

(U//FOUO) Contract Variance

Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2017)	-4.8	-4.3
Previous Cumulative Variances	+0.4	+10.6
Net Change	-5.2	-14.9

(U//FOUO) Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to an accounting change which allocates factory support costs on the basis of touch labor hours. Optic system build challenges and other rework and design changes have also driven a cost variance. This is the first production run of the Multi-spectral Targeting System-B (MTSB) DAS-4 turrets. The cost impact will be partially recovered due to Hours per Unit improvement projects.

The unfavorable net change in the schedule variance is due to later than planned delivery of the Tri-Beam Emission & Receiver (TBEAR) Lasers, Electro-Optics Innovations (EOI), and precision metals components. The delay in materials has caused a later than planned start and completion of production kits.

(U//FOUO) Contract Identification

Appropriation: RDT&E
Contract Name: Hybrid Release 1
Contractor: General Atomics Corporation
Contractor Location: 14200 Kirkham Way
 Poway, CA 92064
Contract Number: FA8620-16-C-3003
Contract Type: Cost Plus Fixed Fee (CPFF)
Award Date: March 18, 2016
Definitization Date: May 23, 2017

(U//FOUO) Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
53.7	N/A	0	35.1	N/A	0	35.1	35.1

(U//FOUO) Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to Contract modification/definitization established the terms and conditions of the MQ-9 Hybrid Release 1 Integration contract.

(U//FOUO) Contract Variance

Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2017)	+4.1	-0.3
Previous Cumulative Variances	--	--
Net Change	+4.1	-0.3

(U//FOUO) Cost and Schedule Variance Explanations

The favorable cumulative cost variance is due to extremely efficient Revision B ground and flight test, and the lower demand for management involvement in the progress of the program. Additionally, favorable cost variance can be attributed to a change in personnel where some program team members transitioned to other United States Air Force programs.

The unfavorable cumulative schedule variance is due to a delay in flight test completion which was caused by Guided Bomb Unit CC execution at China Lake, California. Despite the delay, fully anticipate this program to complete on schedule.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	3	3	3	100.00%
Production	260	261	433	60.28%
Total Program Quantity Delivered	263	264	436	60.55%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	13162.4	Years Appropriated	17
Expended to Date	5983.3	Percent Years Appropriated	62.96%
Percent Expended	45.46%	Appropriated to Date	9398.6
Total Funding Years	27	Percent Appropriated	71.40%

The above data is current as of February 12, 2018.

Workmanship escapes on production aircraft continue to be observed and have delayed acceptance of several aircraft. The Program Office is actively working with the contractor, Defense Contract Management Agency, and Detachment 3 teammates to resolve defects and process deficiencies. The above numbers reflect deliveries through December 2017. Deliveries of FY 2014 aircraft completed in October 2017 and delivery of the first 30 FY 2015 aircraft began in December 2017. Negotiations for the award of the FY 2017 contract (24 aircraft) began November 14, 2017 and are on track to complete by End of Month January 2018.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	December 18, 2017
Source of Estimate:	POE
Quantity to Sustain:	366
Unit of Measure:	Aircraft
Service Life per Unit:	20.00 Years
Fiscal Years in Service:	FY 2002 - FY 2044

The current POE was completed prior to the FY 2019 PB increase of 70 MQ-9 Blk 5 aircraft. The POE is based off of the FY 2019 BES revised number of 366 aircraft and does not reflect the most recent PB number of 436.

The O&S costs are from the current POE which is based on historical costs and estimated future costs through FY 2044. The MQ-9 Reaper has been flying operations since 2006.

Historical costs are obtained from monthly Contractor Logistics Support (CLS) cost reports, Air Force Total Ownership Cost (AFTOC) actuals, and other data sources. Future costs are based on flying hour projections, manpower projections, number of operating locations, and applicable rates and factors. Flying hours are based on the number of anticipated Combat Lines (CLs). The total MQ-9 Reaper life cycle flying hours are based on the Air Combat Command (ACC) MQ-9 Reaper standup plan, ACC projected flight hours per CL, and the defined MQ-9 Reaper life cycle. The attrition rate is based upon the official Air Force Studies and Analysis MQ-9 Reaper attrition model. Quantity of aircraft per CL will continue to vary based on mission requirements and future operations.

Unit-Level Manpower costs are estimated using manpower projections. Unit Operations cost factors include fuel, training munitions, and temporary duty costs. Maintenance costs include Operational-level, Depot-level (D-level), and Government Furnished Equipment repair. Sustaining support includes D-level sustaining engineering and program management and system specific training derived from actual costs from the AFTOC database, and converted to a cost per flying hour. Continuing System Improvements costs include Reliability & Maintainability Enhancements and Software Maintenance supported via the CLS contract. Indirect Support costs are based on factors from Air Force Instruction 65-503 table A56-1, which were applied against manpower projections.

Sustainment Strategy

Sustainment of the MQ-9 Reaper systems is currently provided through CLS contracts with General Atomics, Aeronautical Systems Incorporated (GA-ASI), and Raytheon. The CLS contracts include program management, logistics support, configuration management, technical manuals, software maintenance, engineering technical services, contractor field service representative support, contractor inventory control point, spares management, depot repair, flight operations support, reliability and maintainability studies, maintenance data collection/entry and depot field maintenance. Supported organizations include ACC, Air National Guard, Air Force Special Operations Command, Air Education and Training Command. The Program Office (PO) is working to transition portions of CLS to a Public Private Partnership that leverages original equipment manufacturer and organic capabilities. Currently, the Air Force Sustainment Center has entered into a Public Private Partnership Agreement with GA-ASI and the Fleet Readiness Center-Southeast has entered into a Public Private Partnership Agreement with Raytheon for depot repair on certain components for the MQ-9 Reapers and Multi-Spectral Targeting System, respectively.

Antecedent Information

The antecedent program for the MQ-9 Reaper is the MQ-1 Predator. The MQ-1 Predator O&S costs are based on the

current POE which utilizes the same methodology as the MQ-9 Reaper O&S estimate. The MQ-1 Predator O&S costs are based on 268 aircraft and a service life of 21 years, with a planned divestiture of the program within the FYDP.

The MQ-1 Predator total BY 2008 O&S figure may be computed by multiplying the average cost per flying hour for each cost element category (totaling \$3.667K) by the total flying hours of the MQ-1 Predator program (2,058,727). The total MQ-1 Predator O&S figure did not change since last reported in the December 2016 SAR due to the cost estimate no longer being updated with sunset planned for March 2018. From a cost per flying hour perspective the MQ-9 Reaper's costs vary slightly from its antecedent program, the MQ-1 Predator.

Annual O&S Costs BY2008 \$M			
Cost Element	MQ-9 Reaper Average Annual Cost Per Aircraft		MQ-1 Predator (Antecedent) Average Annual Cost Per Aircraft
Unit-Level Manpower	1.536		0.429
Unit Operations	0.599		0.297
Maintenance	1.575		0.422
Sustaining Support	1.782		0.009
Continuing System Improvements	0.328		0.105
Indirect Support	0.637		0.081
Other	0.000		0.000
Total	6.457		1.343

The average cost per flying hour for an MQ-9 Reaper is \$3.530K. The flying hour projection is based on the updated flying hour profile received from ACC. The Program Office utilized a bottoms-up cost estimating approach to estimate the MQ-9 Reaper life cycle cost.

Item	Total O&S Cost \$M			
	MQ-9 Reaper			MQ-1 Predator (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	47215.4	51936.9	47260.7	7570.0
Then Year	65058.9	N/A	69664.0	N/A

Equation to Translate Annual Cost to Total Cost

The average annual cost per aircraft is derived by dividing the total life cycle cost by the number of aircraft and total service life years. $\$47260.7\text{M (BY O\&S cost)} / 366 \text{ (total aircraft)} / 20 \text{ (total service life years)} = \6.46M .

O&S Cost Variance		
Category	BY 2008 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2016 SAR	40492.4	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	4833.6	Inflation errors were discovered in the requirements beyond the FYDP. These errors will be addressed and corrected in

the FY18 POE update.

Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	1934.7	Additional training requirements for the MQ-9 system and increased Depot Repair and Field Service Representative requirements for Contractor Logistics Support.
Other	0.0	
Total Changes	6768.3	
Current Estimate	47260.7	

Disposal Estimate Details

Date of Estimate: December 18, 2017
Source of Estimate: POE
Disposal/Demilitarization Total Cost (BY 2008 \$M): Total costs for disposal of all Aircraft are 14.0

The MQ-9 Reaper disposal cost estimate is based on the current POE and assumes cold storage. The estimate utilizes various factors such as aircraft quantity and weights to calculate shipping costs, demolition costs, and disposal of hazardous materials.