Selected Acquisition Report (SAR)

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

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

As of FY 2020 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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

Program Information

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

DoD Component
Air Force

Responsible Office

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Date Assigned: November 1, 2017

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 irregular 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 is adapted for high-altitude use, 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 laser range finder/designator feature 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 (AGM-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. An MQ-9 can be transformed into an MQ-9 ER through the integration of a depot-level 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 weapons and other 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 Element (LRE) Ground Control Station (GCS) for take-off and landing operations at the Forward Operating Location (FOL), while the Mission Control Element (MCE) crew based in the Continental United States executes command and control of the remainder of the mission via Ku-band satellite link. 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

From January 2018 through December 2018, MQ-9 amassed over 325,000 total flight hours, with 91% of those hours flown in support of combat operations. The MQ-9 has flown over 1.9 million cumulative flight hours as of December 31, 2018, and remains among the most called-upon Warfighter global combat assets.

The Air Force has contracted with General Atomics Aeronautical Systems, Incorporated (GA-ASI) for a total of 366 MQ-9 Reaper Unmanned Aircraft Systems (MQ-9s). All 195 MQ-9 Block 1 weapon systems have been delivered. Of the 171 total MQ-9 Block 5s, 92 have been delivered and the remaining aircraft are on contract.

Initial MQ-9 Block 5 assets and support equipment were successfully deployed in June 2017 to support Air Combat Command combat operations, with the first MQ-9 Block 5 operational combat line successfully flown on June 23, 2017. Since then, based on monthly User updates, Block 5 has performed well. 42,000+ Block 5 combat hours have been amassed since the first combat line flew.

During FY 2015, the MQ-9 team successfully completed the initial acquisition and fielding of the MQ-9 Extended Range (ER) weapon system. MQ-9 ER provides extended endurance, allowing for increased time-on-station and mission radius. As of December 2018, 30 of the 118 planned Block 1 ER Follow-on retrofit aircraft were fielded, bringing the total Block 1 ER fleet to 73 aircraft. The Block 5 Follow-on Reaper Capability Enhancement (FORCE) contract adds ER, Stations 1 and 7 wiring for Beyond Line-of-Sight (BLOS), and Payload Multiplexer retrofitted capabilities awarded on May 16, 2018 for retrofit of 122 Block 5 aircraft by FY 2024.

As of December 31, 2018, 29 of 62 GCS Block 30 new production deliveries and 41 of 75 GCS Block 30 retrofit deliveries were completed, totaling 70 of 137 Block 30s fielded for the Warfighters' use.

The GCS Block 50 completed the second and final round of Contractor Test (CT) which culminated with Block 50 GCS initial flights in January 2019. CT is meeting all objectives to date and is reducing risks of upcoming Block 50 DT. A Block 50 contractor first flight was conducted on January 8, 2019; the MQ-9 aircraft, Block 50 GCS, and sensors operated as designed based on initial analysis. Government DT started in early 2019 following CT and will complete in early CY 2020. The SPO is working on a Cooperative Research and Development Agreement with GA-ASI which will synchronize Block 50 GCS with the MQ-9 single Operational Flight Program (OFP) strategy and jump-start Block 50 GCS production saving one year in Government contracting timelines.

The MQ-9 team continues its proactive work with Users, Air Force Research Laboratory, and Industry partners to manage MQ-9 even more efficiently. In June 2018, Air Combat Command (ACC) (AF Lead Command), Air Force Special Operations Command (AFSOC), the Air National Guard (ANG), and the MQ-9 System Program Office (SPO) convened the third semi-annual MQ-9 Enterprise Technology Maturation Efforts (TME) Roadmap Conference. ACC published the resulting MQ-9 Candidate Capabilities List (CCL) and Enterprise Objectives on July 19, 2018 that solidified the prioritized capabilities that the MQ-9 acquisition/sustainment team will rapidly deliver over the next five years. A collaborative MQ-9 TME Roadmap process is in work by these enterprise partners to align prioritized CCL capabilities with Enterprise Objectives and enable MQ-9 team to efficiently plan, resource, and field – on 6-12 month intervals – the Using Command's priority warfighting capabilities.

Based on Users' requests, the MQ-9 SPO has transitioned to a single MQ-9 Operational Flight Program (OFP) software strategy for the ACC, AFSOC, and ANG MQ-9 fleet. This single software approach minimizes software configurations and complexity for operators and maintainers while delivering improved MQ-9 capabilities every 6-12 months. This initial OFP is the first combined AFSOC-ACC-ANG single OFP software for the MQ-9 fleet and is the first AFSOC software to control AFSOC fielded Block 5 aircraft. AFSOC fielding of 2407 on Block 1 aircraft began December 2018; fielding on Block 5 aircraft began January 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**
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 AF and Chief of Staff of the 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 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 FY 2005 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 (658th 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 FY 2006/FY 2007 buys and the associated procurement funding were authorized by Congress. By July 2007, the 658th AESS was designated the 703rd 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.

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.
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 CY 2014.
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.
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.
June 2017	Initial MQ-9 Block 5 assets and support equipment were successfully deployed in June 2017 to support Users' combat operations, with the first MQ-9 Block 5 operational combat line flown on June 23, 2017.
March 2018	The Air Force transitioned to an MQ-9 Reaper fleet on March 9, 2018, retiring the MQ-1 Predator at Creech AFB during the MQ-9 Commanders' Summit. The Air Force's 60 global combat lines have since been flown by MQ-9 Reapers.
August 2018	The MQ-9 SPO assembled an MQ-9 Reaper Cyber Security Plan of Action and Milestones

	(POAM) to assure the MQ-9 Reaper weapon system's cyber resiliency. The SPO has presented the POAM to the leadership of Air Combat Command, US Special Operations Command, and Air Force Special Operations Command, and secured approvals of the plan.

Threshold Breaches

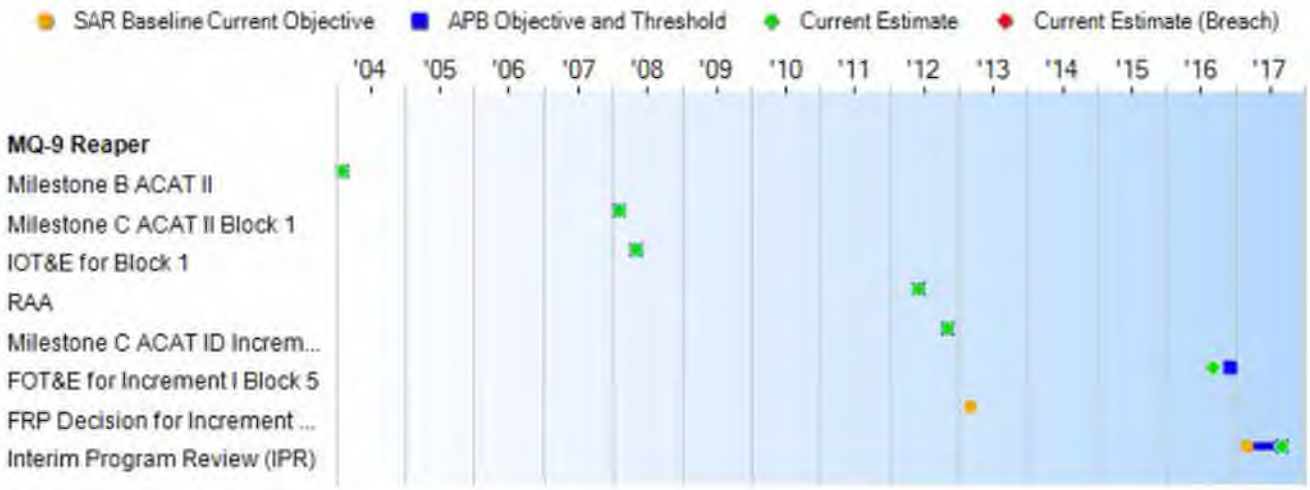
APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☑
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

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

Explanation of Breach

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

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

Change Explanations

None

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.

Acronyms and Abbreviations

ACAT - Acquisition Category
FOT&E - Follow-On Test and Evaluation
FRP - Full Rate Production
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/OT continual for KPP as new capabilities are implemented on the MQ-9 weapon system; 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	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-	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	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-

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) IA requirements including availability, integrity, authenticat-ion, confidential-ity, and nonrepudiat-ion, 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.	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) 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.	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) 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.		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) 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.

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

Air Force 3300 01 0205219F

Project	Name	
BHD000	MQ-9 Operations	(Sunk)
KWRD143	RPA Fixed Ground Control Station Facility	
RKMF113	Add RPA Weapons School 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	778.8	1365.1	1501.6	1411.3	809.9	1488.8	1554.0
Procurement	9824.0	10175.3	11192.8	9571.2	10866.0	11765.5	11005.6
Flyaway	--	--	--	7076.9	--	--	8141.3
Recurring	--	--	--	7076.9	--	--	8141.3
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	2494.3	--	--	2864.3
Other Support	--	--	--	902.7	--	--	1048.4
Initial Spares	--	--	--	1591.6	--	--	1815.9
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	11055.7	11834.8	13309.9	12638.0

[1] *APB Breach*

Cost Notes

If an Independent Cost Estimate, Component Cost Estimate, or Program Office Estimate has been completed for the program in the previous year, list any program risks identified in the estimates, the potential impacts of the risks on program cost, and approaches to mitigate the risks.

Program Office Estimate (POE) completed March 14, 2018.

The POE provides adequate resources to execute the program while encountering and mitigating acceptable levels of technical, schedule, and cost risk. The baseline includes the most probable funding and schedule to complete development, retrofit, and production efforts. The estimate includes adequate funding to cover production, however, the variability in aircraft quantities and funding will continue to adversely affect acquisition schedules and unit cost.

Total Quantity			
Quantity	**SAR Baseline Production Estimate**	**Current APB Production**	**Current Estimate**
RDT&E	3	3	3
Procurement	388	401	430
Total	391	404	433

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 2020 President's Budget / December 2018 SAR (TY$ M)									
Appropriation	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
RDT&E	1318.5	22.8	50.9	61.0	33.0	33.6	34.2	0.0	1554.0
Procurement	7878.3	769.2	587.9	553.5	752.4	392.4	71.9	0.0	11005.6
MILCON	78.4	0.0	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 2020 Total	9275.2	792.0	638.8	614.5	785.4	426.0	106.1	0.0	12638.0
PB 2019 Total	9398.6	951.9	835.6	503.9	481.0	666.9	162.1	162.4	13162.4
Delta	-123.4	-159.9	-196.8	110.6	304.4	-240.9	-56.0	-162.4	-524.4

Funding Notes

The FY 2019 PB request was for 29 MQ-9 Block 5 aircraft in FY 2019; however, the program was only appropriated 24 aircraft in FY 2019 for a delta of five aircraft shown in the Quantity Summary table.

Quantity Summary FY 2020 President's Budget / December 2018 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Development	3	0	0	0	0	0	0	0	0	3
Production	0	363	24	12	9	17	2	3	0	430
PB 2020 Total	3	363	24	12	9	17	2	3	0	433
PB 2019 Total	3	363	29	20	4	4	13	0	0	436
Delta	0	0	-5	-8	5	13	-11	3	0	-3

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	--	--	--	--	--	--	118.4
2018	--	--	--	--	--	--	113.7
2019	--	--	--	--	--	--	22.8
2020	--	--	--	--	--	--	50.9
2021	--	--	--	--	--	--	61.0
2022	--	--	--	--	--	--	33.0
2023	--	--	--	--	--	--	33.6
2024	--	--	--	--	--	--	34.2
Subtotal	3	--	--	--	--	--	1554.0

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	--	--	--	--	--	--	102.4
2018	--	--	--	--	--	--	96.3
2019	--	--	--	--	--	--	18.9
2020	--	--	--	--	--	--	41.4
2021	--	--	--	--	--	--	48.7
2022	--	--	--	--	--	--	25.8
2023	--	--	--	--	--	--	25.8
2024	--	--	--	--	--	--	25.7
Subtotal	3	--	--	--	--	--	1411.3

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	574.2	173.4	--	747.6	203.1	950.7
2017	24	353.3	183.7	--	537.0	114.9	651.9
2018	16	249.1	162.2	--	411.3	205.3	616.6
2019	24	381.2	142.3	--	523.5	245.7	769.2
2020	12	230.6	244.3	--	474.9	113.0	587.9
2021	9	149.6	266.4	--	416.0	137.5	553.5
2022	17	335.9	227.0	--	562.9	189.5	752.4
2023	2	70.3	213.2	--	283.5	108.9	392.4
2024	3	26.0	9.6	--	35.6	36.3	71.9
Subtotal	430	5673.6	2467.7	--	8141.3	2864.3	11005.6

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	193.9	829.1
2013	39	523.7	130.6	--	654.3	135.1	789.4
2014	23	249.0	61.2	--	310.2	109.7	419.9
2015	24	358.9	88.6	--	447.5	145.6	593.1
2016	33	491.9	148.6	--	640.5	174.0	814.5
2017	24	296.6	154.3	--	450.9	96.5	547.4
2018	16	204.5	133.2	--	337.7	168.6	506.3
2019	24	306.9	114.6	--	421.5	197.7	619.2
2020	12	182.0	192.8	--	374.8	89.2	464.0
2021	9	115.8	206.1	--	321.9	106.4	428.3
2022	17	254.8	172.2	--	427.0	143.8	570.8
2023	2	52.3	158.5	--	210.8	81.0	291.8
2024	3	19.0	7.0	--	26.0	26.4	52.4
Subtotal	430	5004.8	2072.1	--	7076.9	2494.3	9571.2

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, Ground Control Stations (GCS) and communications. Retrofits include GCS and other miscellaneous communications and sensor retrofits.

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
France	11/13/2018	4	47.3	FMS case FR-D-DAS provides funding for procurement of MQ-9 Payload Sensor Suites and associated support.
United Kingdom	9/10/2018	2	16.2	FMS Case UK-D-QBR provides funding for procurement of MQ-9 simulators and support
United Kingdom	6/26/2018	0	148.9	FMS Case UK-D-QDL provides funding for parts and services
United Kingdom	5/23/2018	0	7.5	FMS Case UK-D-QDH provides funding for defense articles and services
United Kingdom	4/11/2018	0	5.0	FMS Case UK-D-QDG provides funding for Outdragon software and associated equipment.
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-S-SAC provides funding for procurement of 16 Predator Unmanned Aerial Vehicles and associated support.
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	119.8	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).
United Kingdom	12/15/2015	0	63.5	FMS Case UK-D-QDH contracting services and defense design
France	12/7/2015	6	320.8	FMS case FR-D-SAC provides funding for six MQ-9 Block 5 aircraft, two MGCS, and assorted support equipment.
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.
United Kingdom	11/12/2015	0	103.1	FMS case UK-D-QBQ provides funding for CLS.

United Kingdom	12/10/2014	0	101.8	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.
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.

Notes

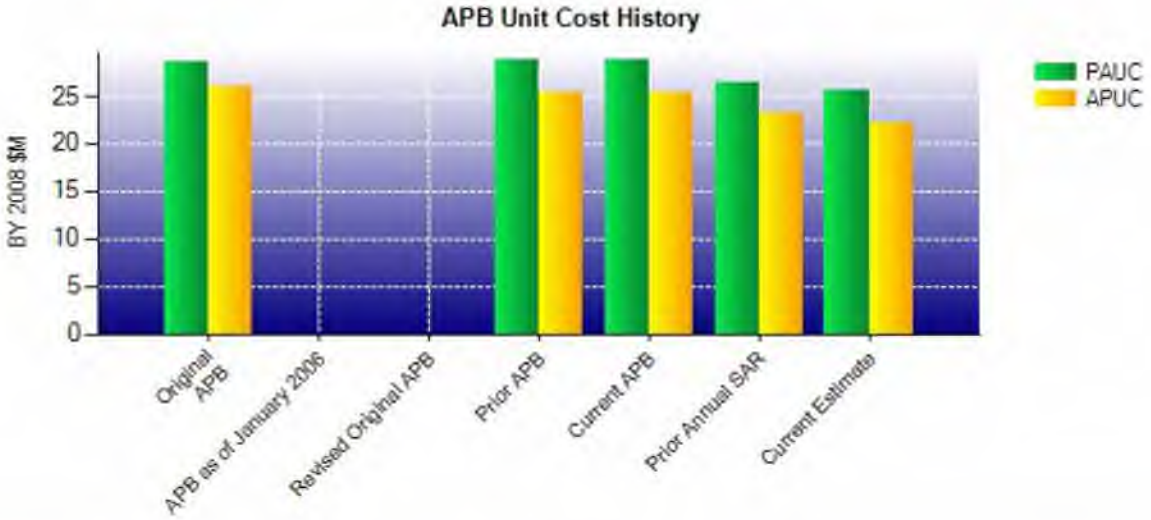
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2008 $M Current UCR Baseline (Apr 2017 APB)	BY 2008 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	11593.7	11055.7	
Quantity	404	433	
Unit Cost	28.697	25.533	-11.03
Average Procurement Unit Cost			
Cost	10175.3	9571.2	
Quantity	401	430	
Unit Cost	25.375	22.259	-12.28

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2008 $M Original UCR Baseline (Feb 2012 APB)	BY 2008 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	11541.3	11055.7	
Quantity	404	433	
Unit Cost	28.568	25.533	-10.62
Average Procurement Unit Cost			
Cost	10402.1	9571.2	
Quantity	401	430	
Unit Cost	25.940	22.259	-14.19



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 2017	26.391	23.199	30.189	26.708
Current Estimate	Dec 2018	25.533	22.259	29.187	25.594

Program Unit Cost decreases are attributable to decreased Ground Control Station buys and Congressional funding reductions.

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	0.290	-0.725	0.576	2.065	-5.339	0.000	2.052	-1.081	29.187

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	0.306	-0.509	0.384	0.839	-5.570	0.000	2.139	-2.411	25.594

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	12638.0
Total Quantity	N/A	N/A	391	433
PAUC	N/A	N/A	30.268	29.187

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	-13.3	+76.6	+4.2	+67.5
Quantity	--	+781.3	--	+781.3
Schedule	+84.3	+165.6	--	+249.9
Engineering	+530.1	+361.2	+3.2	+894.5
Estimating	+139.9	-1935.1	-87.9	-1883.1
Other	--	--	--	--
Support	-31.3	+1248.8	--	+1217.5
Subtotal	+709.7	+698.4	-80.5	+1327.6
Current Changes				
Economic	+3.1	+54.9	--	+58.0
Quantity	--	+176.1	--	+176.1
Schedule	--	-0.3	--	-0.3
Engineering	--	-0.5	--	-0.5
Estimating	+31.3	-460.1	--	-428.8
Other	--	--	--	--
Support	--	-328.9	--	-328.9
Subtotal	+34.4	-558.8	--	-524.4
Total Changes	+744.1	+139.6	-80.5	+803.2
CE - Cost Variance	1554.0	11005.6	78.4	12638.0
CE - Cost & Funding	1554.0	11005.6	78.4	12638.0

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	--	+647.8	--	+647.8
Schedule	+66.4	+54.7	-0.1	+121.0
Engineering	+457.5	+214.6	+2.7	+674.8
Estimating	+112.7	-1662.6	-77.9	-1627.8
Other	--	--	--	--
Support	-27.3	+966.5	--	+939.2
Subtotal	+609.3	+221.0	-75.3	+755.0
Current Changes				
Economic	--	--	--	--
Quantity	--	+128.0	--	+128.0
Schedule	--	-0.2	--	-0.2
Engineering	--	-0.4	--	-0.4
Estimating	+23.2	-343.7	--	-320.5
Other	--	--	--	--
Support	--	-257.5	--	-257.5
Subtotal	+23.2	-473.8	--	-450.6
Total Changes	+632.5	-252.8	-75.3	+304.4
CE - Cost Variance	1411.3	9571.2	73.2	11055.7
CE - Cost & Funding	1411.3	9571.2	73.2	11055.7

Previous Estimate: December 2017

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+3.1
Baseline extension to include FY 2024 requirements. (Estimating)	+25.7	+34.2
Revised estimate to realign funding from ACAT II to MQ-9 Reaper ACAT IC program. (Estimating)	+4.2	+5.2
Revised estimate to reflect actuals. (Estimating)	-5.4	-6.7
Adjustment for current and prior escalation. (Estimating)	-1.3	-1.4
RDT&E Subtotal	+23.2	+34.4

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+54.9
Total Quantity variance resulting from a decrease of three Block 5 MQ-9 aircraft from 433 to 430. (Subtotal)	-36.7	-49.3
Quantity variance resulting from a decrease of three Block 5 MQ-9 aircraft from 433 to 430. (Quantity)	(-38.4)	(-51.6)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(-0.2)	(-0.3)
Allocation to Engineering resulting from Quantity change. (Engineering) (QR)	(-0.4)	(-0.5)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(+2.3)	(+3.1)
Additional Quantity variance resulting from quantity reduction adversely impacting Economic Order Quantity and increasing unit cost of Block 5 MQ-9 aircraft. (Quantity)	+166.4	+227.7
Reduced funding due to Congressional budget reductions to Ground Control Stations and DAS-4 procurement. (Estimating)	-146.8	-180.3
Adjustment to align program requirements with FY 2020 PB which truncates at FY 2024. (Estimating)	-87.9	-123.5
Revised estimate due to Ground Control Station production and associated Other Government Cost rephasing. (Estimating)	-94.0	-138.1
Adjustment for current and prior escalation. (Estimating)	-17.3	-21.3
Adjustment for current and prior escalation. (Support)	-6.8	-7.7
Decrease in other support to reflect actuals, updated cost models, and align program requirements with FY 2020 PB which truncates program funding at FY 2024. (Support)	-195.3	-252.0
Decrease in Initial Spares resulting from a decrease of aircraft and Ground Control Station rephasing. (Support) (QR)	-55.4	-69.2
Procurement Subtotal	-473.8	-558.8

(QR) Quantity Related

~~(U//FOUO)~~ Contracts

~~(U//FOUO)~~ Contract Identification

Appropriation:

(b)(4)

(b)(4)

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	36.3	N/A	0	36.3	36.3

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the Period 2 retrofit option that was funded by the United States Air Force.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/25/2019)	+0.1	-0.6
Previous Cumulative Variances	+1.2	+0.2
Net Change	-1.1	-0.8

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to the increase in tool usage is driving additional maintenance cost as tool refurbishment is required every 30 cycles. Risk mitigation proposal received November 2018.

The unfavorable net change in the schedule variance is due to installations being front-loaded rather than back-loaded (as it should have been) in the Integrated Master Schedule for Period 2 retrofits. Installations are actually ahead of schedule.

(b)(4)

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Appropriation:

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Notes

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

(U//~~FOUO~~) Contract Identification

Appropriation:

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Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	3	3	3	100.00%
Production	263	272	430	63.26%
Total Program Quantity Delivered	266	275	433	63.51%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	12638.0	Years Appropriated	18
Expended to Date	6670.9	Percent Years Appropriated	78.26%
Percent Expended	52.78%	Appropriated to Date	10067.2
Total Funding Years	23	Percent Appropriated	79.66%

The above data is current as of February 28, 2019.

Notes

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 and Defense Contract Management Agency to resolve defects and process deficiencies. As of December 31, 2018, a total of 92 of 171 new production MQ-9 Block 5 aircraft deliveries are complete, with production deliveries scheduled through FY 2021. The FY 2015 contract for 30 Block 5 production aircraft has delivered 24 of 30 aircraft as of December 31, 2018. The FY 2016 production contract for 36 additional Block 5 aircraft awarded on May 16, 2017, and will begin deliveries in March 2019. The FY 2017 MQ-9 Block 5 production contract for 24 aircraft awarded on March 29, 2018. The FY 2018 Block 5 production buy of 16 aircraft awarded on November 5, 2018. Work on an MQ-9 Block 5 FY 2019 production buy continues with the Request for Proposal released on October 18, 2018.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	January 18, 2018
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 increase of MQ-9 Blk 5 aircraft. The POE is based off of the FY2019 BES and does not reflect the most recent PB number of 433.

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	0.651	0.297
Maintenance	1.256	0.422
Sustaining Support	1.425	0.009
Continuing System Improvements	0.342	0.105
Indirect Support	0.637	0.081
Other	0.000	0.000
Total	5.847	1.343

The average cost per flying hour for an MQ-9 Reaper is $3,211K. 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	42802.6	7570.0
Then Year	65058.9	N/A	62311.3	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. $42,802.5M (BY O&S cost) / 366 (total aircraft) / 20 (total service life years) = $5.85M.

O&S Cost Variance		
Category	**BY 2008 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2017 SAR	47260.7	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	-4458.1	Corrections in Cost Estimating Inflation errors discovered

		in the requirements beyond the FYDP. These errors have been addressed and corrected in the FY 2018 POE update
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	-4458.1	
Current Estimate	42802.6	

Disposal Estimate Details

Date of Estimate:	December 18, 2017
Source of Estimate:	POE
Disposal/Demilitarization Total Cost (BY 2008 $M):	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.