



Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-387



KC-46A Tanker Modernization (KC-46A)

As of FY 2015 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Common Acronyms and Abbreviations

Acq O&M - Acquisition-Related Operations and Maintenance
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
BA - Budget Authority/Budget Activity
BY - Base Year
DAMIR - Defense Acquisition Management Information Retrieval
Dev Est - Development Estimate
DoD - Department of Defense
DSN - Defense Switched Network
Econ - Economic
Eng - Engineering
Est - Estimating
FMS - Foreign Military Sales
FY - Fiscal Year
IOC - Initial Operational Capability
\$K - Thousands of Dollars
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MILCON - Military Construction
N/A - Not Applicable
O&S - Operating and Support
Oth - Other
PAUC - Program Acquisition Unit Cost
PB - President's Budget
PE - Program Element
Proc - Procurement
Prod Est - Production Estimate
QR - Quantity Related
Qty - Quantity
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
Sch - Schedule
Spt - Support
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting

Program Information

Program Name

KC-46A Tanker Modernization (KC-46A)

DoD Component

Air Force

Responsible Office

Responsible Office

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Date Assigned	August 1, 2012

References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated August 24, 2011

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated August 24, 2011

Mission and Description

The KC-46 Tanker Modernization (KC-46A) Program is intended to replace the United States Air Force's aging fleet of KC-135 Stratotankers which have been the primary refueling aircraft for more than 50 years.

With more refueling capacity and enhanced capabilities, improved efficiency and increased capabilities for cargo and aeromedical evacuation, the KC-46A will provide aerial refueling support to the Air Force, Navy, and Marine Corps as well as allied nation coalition force aircraft.

The KC-46A will be able to refuel any fixed-wing receiver capable aircraft on any mission. This aircraft is equipped with a modernized KC-10 refueling boom integrated with a proven fly-by-wire control system and capable of delivering a fuel offload rate required for large aircraft. Furthermore, the hose and drogue system adds additional mission capability that is independently operable from the refueling boom system.

Two high-bypass turbofans, mounted under 34-degree swept wings, power the KC-46A to take off at gross weights up to 415,000 pounds. The centerline drogue and wing aerial refueling pods are used to refuel aircraft fitted with probes. All aircraft will be configured for the installation of a Multi-Point Refueling System.

Multi-Point Refueling System-configured aircraft will be capable of refueling two receiver aircraft simultaneously from special "pods" mounted under the wing. One Aerial Refueling Operator controls the boom, centerline drogue, and wing refueling pods during refueling operations. This new tanker utilizes an advanced KC-10 boom, a center-mounted drogue, and wing aerial refueling pods, allowing it to refuel multiple types of receiver aircraft as well as foreign national aircraft on the same mission.

A cargo deck above the refueling system can accommodate a mixed load of passengers, patients, and cargo. The KC-46A can carry up to eighteen 463L cargo pallets. Seat tracks and the onboard cargo handling system make it possible to simultaneously carry palletized cargo, seats, and patient support pallets in a variety of combinations. The KC-46A offers significantly increased cargo and aeromedical evacuation capabilities compared to the KC-135R.

The aircrew compartment includes 15 permanent seats for aircrew, which includes permanent seating for the Aerial Refueling Operator and an Aerial Refueling Instructor. Panoramic displays provide the Aerial Refueling Operator wing-tip- to-wing-tip situational awareness.

Executive Summary

This SAR reflects cost and funding data based on the FY 2015 PB.

The KC-46 Program is on track. With the Engineering and Manufacturing Development (EMD) program approximately 50 percent complete, Boeing has met or exceeded all contractual requirements to date. Government funding has been stable with no engineering changes to the design.

On February 24, 2011, the Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)) approved Milestone B and certified (with waivers to provisions (a)(1)(B) and (a)(1)(D)) the components set forth in section 2366b of title 10, United States Code. Pursuant to this code, the USD(AT&L) waived two provisions in its certification because of differences between the Air Force's Service Cost Position and the Future Years Defense Program (FYDP) associated with the FY 2013 PB. The certification requirement for these two provisions has not yet been met, and the Department will continue to review the KC-46A program at least annually until the certification components are satisfied.

Boeing's Wichita, Kansas finishing center—where Boeing had originally planned to complete the military modifications under a Supplemental Type Certificate to turn the 767-2C commercial aircraft into a KC-46 tanker — closed at the end of 2013 and all KC-46 work completed transition to the Puget Sound area in Seattle, Washington. Boeing must still deliver on all contract schedule and performance requirements, and the Government is only liable up to the competitively negotiated contract ceiling price for development and the firm-fixed and not-to-exceed prices for production.

The KC-46 Aircrew Training System (ATS) contract was awarded on May 1, 2013 to FlightSafety Services Corporation without any subsequent competitor protest. A Program Startup Workshop with assistance from Defense Acquisition University was conducted June 26-28, 2013 at Wright-Patterson Air Force Base, Ohio.

The KC-46 Program Office, Boeing, and Defense Contract Management Agency conducted a Joint Schedule Risk Assessment (SRA) on May 22-23, 2013. The program office conducted analysis to verify/validate the Integrated Master Schedule (IMS) quality, the assumptions used, the validity of the results, and the SRA schedule drivers. The SRA resulted in a projected schedule risk of 2.6 months to Tanker First Flight (FF) and 2.9 months to Boeing's "planned" Required Assessments Available (RAA) date of March 30, 2017. However, the SRA projects Boeing has a better than 90 percent chance of meeting the contracted RAA date of August 24, 2017. The KC-46 Program Office will continue to manage and mitigate schedule risks with Boeing.

Nine months of incremental and Subsystem Critical Design Reviews (CDRs) were completed in May 2013, followed by a Weapon System CDR Go/No-Go decision briefing on June 4, 2013 to determine if the July 8, 2013 CDR start was achievable. In preparation for the planned KC-46 Weapon System CDR (July 8-10, 2013), the program completed an update CDR with Boeing the week of June 10, 2013. The event summarized review and closure activities that occurred since the various prior subsystem CDRs, and it served as an overview of the planned details for the CDR event, confirming all entrance criteria were on track. The Weapon System CDR was successfully conducted from July 8-10, 2013 at Boeing's Harbour Pointe facility. Overall design maturity was demonstrated to be at a high level, consistent with the commercial derivative nature of the design approach. There were a total of 20 action items taken at the CDR. Of the 20, six were considered critical and required resolution prior to formal closure of CDR. All action items were complete, and the Weapon System CDR was officially closed (via contract letter) on August 21, 2013, one month ahead of the contractual requirement of September 24, 2013. All documents to establish the initial and allocated baseline were approved. Overall, the KC-46 CDR was a significant success.

The KC-46A Operational Assessment-1 report was published on June 11, 2013, culminating a 7.5-month effort

(November 2012 – June 2013) to assess the current weapon system design for CDR and Initial Operational Test & Evaluation readiness. The Air Force Operational Test and Evaluation Center assessment of the KC-46A reflected the program is on track to meet effectiveness, suitability, and mission capability requirements. The report identified 98 recommendations, which have been assessed by the program office; the majority are issues in process of resolution through current program development activities. Progress on all the recommendations is reviewed on a regular basis.

The first EMD aircraft began assembly on June 26, 2013, followed by EMD aircraft #2 on August 19, 2013, EMD aircraft #3 on October 17, 2013, and EMD #4 production on January 16, 2014. Boeing is experiencing part shortage/delay and assembly issues with EMD #1, which are impacting aircraft incompletion activities, this is not uncommon for the first-of-type aircraft. Boeing is expediting as much as possible and developing alternative solutions to maintain the overall milestone schedule for EMD #1 first flight this summer. The first flight of EMD aircraft #2 (in the KC-46 tanker configuration) is scheduled for January 2015. The Integrated Test Team (ITT) met quarterly in 2013, most recently December 10-12, 2013, where it focused on preparation for the Test Readiness Review (June 2014), FF of the 767-2C (June 2014), and FF of the KC-46 (January 2015). The ITT also reviewed the overall verification plan, build plan for the Final Test Plans, air refueling receiver aircraft availability, test program schedules, and planning for the Test and Evaluation Master Plan document update to support Milestone C. The Integrated Test Force conducted Dry Run #2 at Boeing Field in preparation for the start of flight testing. Test execution and reporting portions of Dry Run exercises have not identified any major gaps. The initial two Dry Runs have shown that test preparation activities (ground operations, maintenance and airplane release for flight test) need additional detail to support the planned test pace. Dry Runs #3 and #4 will stress these test preparation areas.

KC-46 ATS conducted a System Requirement Review and System Functional Review on September 23-27, 2013. The Program Office conducted the first of three incremental Integrated Baseline Reviews (IBR) on October 28, 2013. The first incremental IBR focused on the Integrated Master Plan and the IMS. The next incremental IBR is scheduled to begin March 17, 2014.

On December 10, 2013, the KC-46 Division completed its annual life cycle cost estimate, also referred to as the Program Office Estimate (POE). The POE encompassed the RDT&E, Production, MILCON, O&S, and Disposal phases. The POE was updated for fact-of-life changes and knowledge gained since contract award. Aside from the EMD Aircraft contract Estimate at Completion (EAC), the estimating changes for the remainder of the life cycle were not notable. RDT&E, Procurement and MILCON costs continue to execute within APB margins. The POE resulted in an approximately 4.4 percent increase (\$5,615M to \$5,864M) to the EAC on the EMD Fixed-Price Incentive Firm contract. This estimate incorporated an assessment of contract cost and schedule performance, as well as cost risks from the May 2013 Integrated Risk Assessment conducted between the KC-46 Division and Boeing. Despite the increased EMD contract EAC in the POE, no additional funding is required, as the Government's liability for the EMD contract is limited to the ceiling price. This increased EMD aircraft contract EAC is independent of funding reductions in the FY 2015 PB.

The second of two Sustainment Feasibility Demonstration (SFD) In-Process Reviews was conducted on January 10, 2014, in support of the long-term sustainment strategy. While meeting with the General Officer/Senior Executive Service level Executive Steering Committee, the SFD team identified various sustainment alternatives regarding continued Federal Aviation Administration certification and participation in the commercial parts pool. The contractor conducted all simulation runs, completed cost modeling efforts, and presented final recommendations, including an assessment of costs, benefits, and risks at the SFD outbrief held on February 28, 2014. The SFD results will inform the KC-46 Product Support Business Case Analysis to be conducted prior to Milestone C.

This SAR reflects a total budget reduction of \$548.9M in RDT&E, Aircraft Procurement Air Force (APAF), and MILCON funding when compared to last year's SAR. These subsequent events include savings based on the award of the ATS contract, reduced risk funding based on continued program stability and successful execution since Milestone B, additional APAF funding for accelerated aircraft procurement, reprogrammed MILCON funds and DoD

budgetary adjustments.

The FY 2015 PB position programmed additional APAF funding into the KC-46 program in both FY 2017 and FY 2018. The additional funding is to accelerate the procurement of five aircraft into the FYDP. The FY 2017 buy-profile increased by three aircraft (from 15 to 18) and FY 2018 was increased by two aircraft (from 15 to 17). The total KC-46 procurement remains at 175 aircraft and future year funding will be reduced to reflect the reduction of these five aircraft past the FYDP.

The KC-46 Program Office received confirmation that on February 24, 2014 the Senate Committee on Appropriations approved a below threshold reprogramming request in the amount of \$8.6M to purchase land necessary for the Tinker Air Force Base weapon system support efforts. This request resulted in FY 2012 MILCON (3300) funds being reprogrammed into the KC-46 funding profile.

The Program Office has three 2014 focus areas: (1) Execution: Road to FF 767-2C; (2) Test: Implementation of "Test Once" Approach, and (3) Long-term Sustainment Strategy Development. The KC-46 Division will continue to focus attention on successful program execution and stability. Program execution will be carefully managed to make certain Boeing delivers what is required by the contract, and the Government maintains the competitively negotiated program cost, schedule, and performance baselines.

The KC-46 Division is closely tracking software as a program risk, but there are no significant software-related issues with this program at this time.

Threshold Breaches

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

Explanation of Breach

O&S Cost Growth:

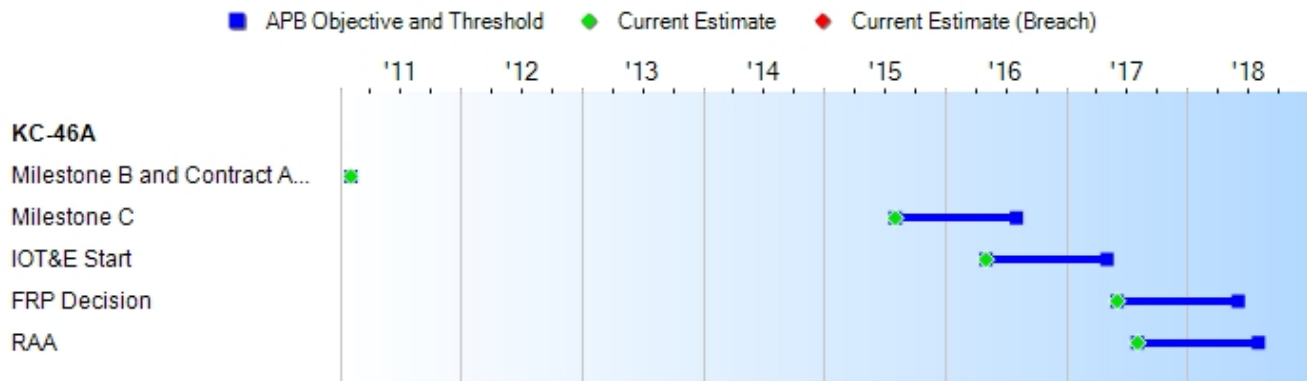
The KC-46A previously reported an O&S Cost Growth breach in the December 2012 SAR. The breach was the result of Air Mobility Command's desire to maximize the benefits of the KC-46A capabilities and leverage that capability across the total force; through increased flight hours and increased crew ratios.

The Program will continue to carry this O&S Cost Growth until the next Milestone is reached and a new APB is established. The Air Force has committed to staying within Total Obligation Authority during the transition from the KC-135 to the KC-46A aircraft.

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

Schedule



Milestones	SAR Baseline Dev Est	Current APB Development Objective/Threshold		
		Current APB Development Objective/Threshold	Current APB Development Objective/Threshold	Current Estimate
Milestone B and Contract Award	FEB 2011	FEB 2011	FEB 2011	FEB 2011
Milestone C	AUG 2015	AUG 2015	AUG 2016	AUG 2015
IOT&E Start	MAY 2016	MAY 2016	MAY 2017	MAY 2016
FRP Decision	JUN 2017	JUN 2017	JUN 2018	JUN 2017
RAA	AUG 2017	AUG 2017	AUG 2018	AUG 2017

Change Explanations

None

Memo

IOT&E Start represents the beginning of Dedicated IOT&E, which will commence upon Office of the Secretary of Defense approval of the Operational Test Readiness Review.

The RAA date is directed to be no later than 78 months after contract award. RAA is defined as 18 aircraft meeting final production configuration with all required training equipment, support equipment, and sustainment support in place to support IOC.

Acronyms and Abbreviations

- FRP - Full Rate Production
- IOT&E - Initial Operational Test and Evaluation
- RAA - Required Assets Available

Performance

Characteristics	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Demonstrated Performance	Current Estimate
Tanker Air Refueling Capability	The aircraft should be capable of accomplishing air refueling of all current and programmed tilt rotor receiver aircraft in accordance with technical guidance and STANAGs using current procedures and refueling airspeeds with no modification to existing receiver air refueling equipment and no restrictions to the refueling envelope at its maximum inflight gross weight. While engaged, the KC-X should be capable of maneuvering throughout the entire	The aircraft should be capable of accomplishing air refueling of all current and programmed tilt rotor receiver aircraft in accordance with technical guidance and STANAGs using current procedures and refueling airspeeds with no modification to existing receiver air refueling equipment and no restrictions to the refueling envelope at its maximum inflight gross weight. While engaged, the KC-X should be capable of maneuvering throughout the entire	The aircraft shall be capable of accomplishing air refueling of all current and programmed fixed-wing receiver aircraft in accordance with technical guidance and STANAGs using current procedures and refueling airspeeds with no modification to existing receiver air refueling equipment and no restrictions to the refueling envelope. The aircraft shall be able to effectively conduct (non-simultaneously) both boom and drogue air refuelings on the same mission.	TBD	Will meet or exceed Current APB Threshold. The aircraft shall be capable of accomplishing air refueling of all current and programmed fixed-wing receiver aircraft in accordance with technical guidance and STANAGs using current procedures and refueling airspeeds with no modification to existing receiver air refueling equipment and no restrictions to the refueling envelope. The aircraft shall be able to effectively conduct (non-simultaneously) both boom and

	refueling envelope, in accordance with applicable air refueling manuals and standard agreements, of any compatible current and programmed tilt rotor receiver aircraft.	refueling envelope, in accordance with applicable air refueling manuals and standard agreements, of any compatible current and programmed tilt rotor receiver aircraft.	While engaged, the KC-X shall be capable of maneuvering throughout the entire refueling envelope, in accordance with applicable air refueling manuals and standard agreements, of any compatible current and programmed fixed wing receiver aircraft.		drogue air refuelings on the same mission. While engaged, the KC-X shall be capable of maneuvering throughout the entire refueling envelope, in accordance with applicable air refueling manuals and standard agreements, of any compatible current and programmed fixed wing receiver aircraft.
Fuel Offload versus Radius	The aircraft should be capable of exceeding the offload versus radius as depicted in Figure 6.1.	The aircraft should be capable of exceeding the offload versus radius as depicted in Figure 6.1.	The aircraft shall be capable, as a minimum, of an offload versus radius as depicted in Figure 6.1.	TBD	Will meet or exceed Current APB Objective. The aircraft should be capable of exceeding the offload versus radius as depicted in Figure 6.1.
Civil/Military CNS/ATM	Aircraft shall be capable of worldwide flight operations at all times in all civil and military airspace at time of	Aircraft shall be capable of worldwide flight operations at all times in all civil and military airspace at time of	Aircraft shall be capable of worldwide flight operations at all times in all civil and military airspace at time of	TBD	Will meet or exceed Current APB Objective. Aircraft shall be capable of worldwide flight operations at all times in

	aircraft delivery, including known future CNS/ATM requirements, with redundant systems. Capability to inhibit CNS/ATM emissions and prohibit transmission of CNS/ATM-related data accumulated during the inhibited portion of the mission. Civil ATC data link media for LOS and BLOS communications.	aircraft delivery, including known future CNS/ATM requirements, with redundant systems. Capability to inhibit CNS/ATM emissions and prohibit transmission of CNS/ATM-related data accumulated during the inhibited portion of the mission. Civil ATC data link media for LOS and BLOS communications.	aircraft delivery, including known future CNS/ATM requirements, with redundant systems. Capability to inhibit CNS/ATM emissions and prohibit transmission of CNS/ATM-related data accumulated during the inhibited portion of the mission. Civil ATC data link media for LOS and BLOS communications.		all civil and military airspace at time of aircraft delivery, including known future CNS/ATM requirements, with redundant systems. Capability to inhibit CNS/ATM emissions and prohibit transmission of CNS/ATM-related data accumulated during the inhibited portion of the mission. Civil ATC data link media for LOS and BLOS communications.
Airlift Capability	The aircraft shall be capable of efficiently transporting equipment and personnel and fit seamlessly into the Defense Transportation System. The aircraft's entire main cargo deck must be	The aircraft shall be capable of efficiently transporting equipment and personnel and fit seamlessly into the Defense Transportation System. The aircraft's entire main cargo deck must be	The aircraft shall be capable of efficiently transporting equipment and personnel and fit seamlessly into the Defense Transportation System. The aircraft's entire main cargo deck must be	TBD	Will meet or exceed Current APB Objective. The aircraft shall be capable of efficiently transporting equipment and personnel and fit seamlessly into the Defense Transportation System.

	convertible to an all cargo configuration that accommodates 463L pallets, an all passenger configuration (plus baggage) (or equivalent AE capability to include ambulatory and/or patient support pallets), and must optimize a full range of palletized cargo, passengers, and AE configurations that fully and efficiently utilize all available main deck space.	convertible to an all cargo configuration that accommodates 463L pallets, an all passenger configuration (plus baggage) (or equivalent AE capability to include ambulatory and/or patient support pallets), and must optimize a full range of palletized cargo, passengers, and AE configurations that fully and efficiently utilize all available main deck space.	convertible to an all cargo configuration that accommodates 463L pallets, an all passenger configuration (plus baggage) (or equivalent AE capability to include ambulatory and/or patient support pallets), and must optimize a full range of palletized cargo, passengers, and AE configurations that fully and efficiently utilize all available main deck space.		The aircraft's entire main cargo deck must be convertible to an all cargo configuration that accommodates 463L pallets, an all passenger configuration (plus baggage) (or equivalent AE capability to include ambulatory and/or patient support pallets), and must optimize a full range of palletized cargo, passengers, and AE configurations that fully and efficiently utilize all available main deck space.
Receiver Air Refueling Capability	The aircraft must be capable of receiver air refueling (IAW current technical directives) to its maximum inflight gross	The aircraft must be capable of receiver air refueling (IAW current technical directives) to its maximum inflight gross	The aircraft must be capable of receiver air refueling (IAW current technical directives) from any compatible	TBD	Will meet or exceed Current APB Objective. The aircraft must be capable of receiver air refueling (IAW current

	weight from any compatible tanker aircraft using current air refueling procedures.	weight from any compatible tanker aircraft using current air refueling procedures.	tanker aircraft using current air refueling procedures.		technical directives) to its maximum inflight gross weight from any compatible tanker aircraft using current air refueling procedures.
Force Protection	Aircraft shall be able to operate in chemical and biological environments	Aircraft shall be able to operate in chemical and biological environments	Aircraft shall be able to operate in chemical and biological environments	TBD	Will meet or exceed Current APB Objective. Aircraft shall be able to operate in chemical and biological environments
Net-Ready	The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations to include: 1) DISR-mandated GIG IT standards	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	The system must fully support execution of joint critical operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for transition to Net-Centric military operations to include: 1) DISR-mandated GIG IT	TBD	Will meet or exceed Current APB Objective. 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)

	<p>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 non-repudiation, 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</p>	<p>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 non-repudiation, 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</p>	<p>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 non-repudiation, 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</p>		<p>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 non-repudiation, 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</p>
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	architecture views.	architecture views.	integrated architecture views.		applicable joint and system integrated architecture views.
Survivability	Aircraft SPM. Tanker aircraft shall be able to operate in hostile environments as discussed in Section 4 and AFTTP 3-3.22B. SPM shall provide automated protection against IR threats as described in AMC Annex to LAIRCM ORD 314-92 dated January 25, 2001. SPM shall provide automated protection against RF threats as described in the ASACM CDD, May 22, 2006, with the exception of Reduction in Lethality values in Table 28. The aircraft system shall support use of existing	Aircraft SPM. Tanker aircraft shall be able to operate in hostile environments as discussed in Section 4 and AFTTP 3-3.22B. SPM shall provide automated protection against IR threats as described in AMC Annex to LAIRCM ORD 314-92 dated January 25, 2001. SPM shall provide automated protection against RF threats as described in the ASACM CDD, May 22, 2006, with the exception of Reduction in Lethality values in Table 28. The aircraft system shall support use of existing	Aircraft SPM. Tanker aircraft shall be able to operate in hostile environments as discussed in Section 4 and AFTTP 3-3.22B. SPM shall provide automated protection against IR threats as described in AMC Annex to LAIRCM ORD 314-92 dated January 25, 2001. SPM shall provide automated protection against RF threats as described in the ASACM CDD, May 22, 2006, with the exception of Reduction in Lethality values in Table 28. The aircraft system shall support use of existing	TBD	Will meet or exceed Current APB Threshold. Aircraft SPM. Tanker aircraft shall be able to operate in hostile environments as discussed in Section 4 and AFTTP 3-3.22B. SPM shall provide automated protection against IR threats as described in AMC Annex to LAIRCM ORD 314-92 dated January 25, 2001. SPM shall provide automated protection against RF threats as described in the ASACM CDD, May 22, 2006, with the exception of Reduction in Lethality values in Table 28.

	<p>night vision devices and laser eye protection devices. The aircraft shall be capable of takeoff, landing, and air refueling, as a tanker and receiver in an NVIS environment. KC-X must be capable of flying tanker tactical profiles as specified in MCM 3-1, Vol 22, AF Tactics, Training, Procedures, June 2003. Aircraft shall have the capability to receive off-board situational awareness data, correlate this data with on-board sensor data, display battle-space information to provide situational awareness, and assist in using counter-measures and defensive</p>	<p>night vision devices and laser eye protection devices. The aircraft shall be capable of takeoff, landing, and air refueling, as a tanker and receiver in an NVIS environment. KC-X must be capable of flying tanker tactical profiles as specified in MCM 3-1, Vol 22, AF Tactics, Training, Procedures, June 2003. Aircraft shall have the capability to receive off-board situational awareness data, correlate this data with on-board sensor data, display battle-space information to provide situational awareness, and assist in using counter-measures and defensive</p>	<p>night vision devices and laser eye protection devices. The aircraft shall be capable of takeoff, landing, and air refueling, as a tanker and receiver in an NVIS environment. KC-X must be capable of flying tanker tactical profiles as specified in MCM 3-1, Vol 22, AF Tactics, Training, Procedures, June 2003. Aircraft shall have the capability to receive off-board situational awareness data, correlate this data with on-board sensor data, display battle-space information to provide situational awareness, and assist in using counter-measures and defensive</p>	<p>The aircraft system shall support use of existing night vision devices and laser eye protection devices. The aircraft shall be capable of takeoff, landing, and air refueling, as a tanker and receiver in an NVIS environment. KC-X must be capable of flying tanker tactical profiles as specified in MCM 3-1, Vol 22, AF Tactics, Training, Procedures, June 2003. Aircraft shall have the capability to receive off-board situational awareness data, correlate this data with on-board sensor data, display battle-space information to provide situational awareness, and assist in using</p>
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	systems to avoid potential threats as discussed in the ASACM CDD. EMP protection for all mission components.	systems to avoid potential threats as discussed in the ASACM CDD. EMP protection for all mission components.	systems to avoid potential threats as discussed in the ASACM CDD. The KC-X fleet shall have EMP protection for flight-critical aircraft systems.		counter-measures and defensive systems to avoid potential threats as discussed in the ASACM CDD. The KC-X fleet shall have EMP protection for flight-critical aircraft systems.
Simultaneous Multi-Point Refuelings	The aircraft shall be provisioned (including structural modifications, plumbing, electrical, etc.) for simultaneous multi-point drogue refueling.	The aircraft shall be provisioned (including structural modifications, plumbing, electrical, etc.) for simultaneous multi-point drogue refueling.	The aircraft shall be provisioned (including structural modifications, plumbing, electrical, etc.) for simultaneous multi-point drogue refueling.	TBD	Will meet or exceed Current APB Objective. The aircraft shall be provisioned (including structural modifications, plumbing, electrical, etc.) for simultaneous multi-point drogue refueling.
Operational Availability	Operational availability shall be not less than 89%.	Operational availability shall be not less than 89%.	Operational availability shall be not less than 80%.	TBD	Will meet or exceed APB Objective. Operational availability shall be not less than 89%.
Mission Reliability	Break Rate shall be equal to or better than the 2006 KC-10 Six	Break Rate shall be equal to or better than the 2006 KC-10 Six	Break Rate shall be equal to or better than the 2006 KC-10 Six	TBD	Will meet or exceed Current APB Objective. Break Rate shall be

	Sigma mean BR of 1.3 (breaks per 100 sorties).	Sigma mean BR of 1.3 (breaks per 100 sorties).	Sigma mean BR of 1.3 (breaks per 100 sorties).		equal to or better than the 2006 KC-10 Six Sigma mean BR of 1.3 (breaks per 100 sorties).
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Requirements Source

Capability Development Document (CDD) Version 7.0 dated December 27, 2006

Change Explanations

None

Memo

Tanker Air Refueling Capability: The KPP objective includes the KPP threshold requirement. Therefore, the KPP objective requires air refueling of all current and programmed fixed-wing receiver aircraft and air refueling of all current and programmed tilt rotor receiver aircraft. The ability to refuel at maximum inflight gross weight portion of this KPP objective was not included as one of the contractually-required 372 mandatory requirements. Therefore, the KC-46A EMD contract does not require the contractor to meet this portion of the objective.

Fuel Offload versus Radius: Figure 6.1, as referenced in the objective and threshold values, is located in the KC-X CDD.

Survivability: Section 4, as referenced in the objective and threshold values, is located in the KC-X CDD. The Electromagnetic Pulse protection for all mission components portion of this KPP objective was not included as one of the contractually-required 372 mandatory requirements. Therefore, the KC-46A EMD contract does not require the contractor to meet this portion of the objective.

OA: OA equals the TAI less the number of depot possessed aircraft (including programmed depot maintenance and unscheduled depot maintenance) less the number of aircraft that are not mission capable divided by TAI. OA as stated in the CDD is equivalent to and meets the requirement for Materiel Availability as required by the Manual for the Operation of the JCIDS.

Mission Reliability: BR is defined in Air Force Instruction 21-101 and is the percentage of aircraft that land in "Code-3", or "Alpha-3" for Mobility AF, status. BR (%) equals number of sorties that land in "Code-3" divided by total sorties flown times 100. Mission Reliability as stated in the CDD meets the requirement for Materiel Reliability as required by the Manual for the Operation of JCIDS.

Acronyms and Abbreviations

AE - Aeromedical Evacuation
AF - Air Force
AFTTP - Air Force Tactics, Techniques, and Procedures
AMC - Air Mobility Command
APB - Acquisition Program Baseline
ASACM - Advanced Situational Awareness and Countermeasures
ATC - Air Traffic Control
ATO - Approval to Operate
BLOS - Beyond Line of Sight
BR - Break Rate
CDD - Capability Development Document
CNS/ATM - Communication Navigation Surveillance/Air Traffic Management
DAA - Designated Approval Authority
DISR - DoD IT Standards Registry
EMD - Engineering and Manufacturing Development
EMP - Electromagnetic Pulse
GIG - Global Information Grid
IA - Information Assurance
IATO - Interim Authority to Operate
IAW - In Accordance With
IR - Infrared
IT - Information Technology
JCIDS - Joint Capabilities Integration and Development System
KIP - Key Interface Profile
KPP - Key Performance Parameter
LAIRCM - Large Aircraft Infrared Countermeasures
LOS - Line of Sight
MCM - Multi-Command Manual
NCOW RM - Net Centric Operations Warfare Reference Model
NVIS - Night Vision and Imaging Systems
OA - Operational Availability
ORD - Operational Requirements Document
RF - Radio Frequency
SPM - Self-Protection Measures
STANAGs - Standard Agreements
TAI - Total Aircraft in the Inventory
TBD - To Be Determined
TV - Technical View
Vol - Volume

Track to Budget

RDT&E

Appn	BA	PE	
Air Force 3600	07	0401221F	
	Project	Name	
	674927	KC-135 Replacement Tanker	(Sunk)
Air Force 3600	05	0605221F	
	Project	Name	
	655271	KC-46	

Procurement

Appn	BA	PE	
Air Force 3010	02	0401221F	
	Line Item	Name	
	KC046A	KC-46A Tanker	

MILCON

Appn	BA	PE	
Air Force 3300	01	0401221F	
	Project	Name	
	VARIOUS	KC-46, MILCON	
Air Force 3730	01	0502576F	
	Project	Name	
	VARIOUS	Facilities Restoration and Modernization - AFR	(Shared)
Air Force 3830	01	0501413F	
	Project	Name	
	VARIOUS	KC-46, Air National Guard (ANG), MILCON	

In the FY 2015 PB, MILCON funds were allocated to APPN 3730 - Facilities Restoration and Modernization - Air Force Reserve (AFR). A new PE (PE# 0502576F) was added to the MILCON Track to Budget. The PE reported is a shared PE in which KC-46 program specific dollars are contained. The Program is working to have KC-46 specific funds broken out into a uniquely identifiable PE for future reporting.

Cost and Funding

Cost Summary

Total Acquisition Cost and Quantity

Appropriation	BY2011 \$M			BY2011 \$M	TY \$M		
	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Dev Est	Current APB Development Objective	Current Estimate
RDT&E	6804.2	6804.2	7484.6	6282.4	7149.6	7149.6	6620.5
Procurement	33040.3	33040.3	36344.3	31582.6	40236.0	40236.0	39593.7
Flyaway	--	--	--	26523.7	--	--	33319.4
Recurring	--	--	--	26523.7	--	--	33319.4
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	5058.9	--	--	6274.3
Other Support	--	--	--	2636.9	--	--	3233.9
Initial Spares	--	--	--	2422.0	--	--	3040.4
MILCON	3673.7	3673.7	4041.1	2601.3	4314.6	4314.6	3246.4
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	43518.2	43518.2	N/A	40466.3	51700.2	51700.2	49460.6

Confidence Level for Current APB Cost 55% -

The Air Force Service Cost Position (SCP) for the KC-46A is at the mean of the cost estimate distribution (in this case the 55 percent confidence level). It takes into consideration all relevant program risks, providing sufficient resources to execute the program under normal conditions encountering average levels of technical, schedule, and programmatic risk and external influence.

Quantity	SAR Baseline Dev Est	Current APB Development	Current Estimate
RDT&E		4	4
Procurement		175	175
Total		179	179

Cost and Funding

Funding Summary

Appropriation and Quantity Summary FY2015 President's Budget / December 2013 SAR (TY\$ M)

Appropriation	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
RDT&E	3335.8	1558.6	776.9	606.4	316.8	21.6	4.4	0.0	6620.5
Procurement	0.0	0.0	1582.7	2426.8	3772.1	3691.4	3316.7	24804.0	39593.7
MILCON	8.6	250.0	187.3	42.0	182.5	313.4	342.6	1920.0	3246.4
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2015 Total	3344.4	1808.6	2546.9	3075.2	4271.4	4026.4	3663.7	26724.0	49460.6
PB 2014 Total	3601.1	1822.9	2933.8	3697.0	3809.9	3718.0	3973.8	28085.6	51642.1
Delta	-256.7	-14.3	-386.9	-621.8	461.5	308.4	-310.1	-1361.6	-2181.5

The "Prior" reduction in the amount of \$256.7M is the result of numerous reductions to the Program's Budget Authority, offset by one addition to the funding profile. The adjustments are as follows: \$142.9M due to FY 2013 Sequestration, \$77.1M for FY 2013 Congressional Rescission, \$43.0M for the Small Business Innovation Research bill, and \$2.3M for across-the-board reductions directed by the Office of Management and Budget. These reductions in funding were all sourced from the RDT&E appropriation. The Program Office received confirmation that on February 24, 2014 the Senate Committee on Appropriations approved adding \$8.6M in funding to purchase land necessary for the Tinker Air Force Base weapon system support efforts. This request resulted in FY 2012 MILCON (3300) funds being reprogrammed into the KC-46 funding profile.

There was a FY 2014 Omnibus Appropriations Bill MILCON reduction in the amount of \$14.3M.

The summation of the FY 2015 - FY 2019 reductions in the amount of \$548.9M are sourced from multiple appropriations and explained as follows:

- 1) The Aircrew Training System contract, competitively awarded on May 1, 2013, provides for \$250.0M to be returned to the Air Force (FY 2015 - FY 2018) (\$44.3M in RDT&E and \$205.7M in Proc).
- 2) The program identified an additional \$655.7M in funding that could be returned to the Air Force during the FY 2015 Program Objective Memorandum (POM) as a result of the program's current performance and assessment of risk. Given the stability of the execution since Milestone B, the program was able to reduce RDT&E funding by \$119.7M (FY 2015 - FY 2018) and in Proc in the amount of \$536.0M within those same years.
- 3) The FY 2015 PB position programmed \$1,139.4M in additional Aircraft Procurement Air Force (APAF) funding into KC-46 in FY 2017 (\$655.2M) and FY 2018 (\$484.2M). The additional funding is to accelerate the procurement of 5 aircraft into the Future Years Defense Program (FYDP). FY 2017 buy-profile increased by 3 aircraft (from 15 to 18) and FY 2018 was increased by two additional aircraft (from 15 to 17). The total KC-46 procurement remains at 175 aircraft and future year funding will be reduced to reflect the reduction of these five aircraft past the FYDP.
- 4) The FY 2015 PB position removed \$20M of RDT&E and \$111.5M of APAF funding through the FYDP (total

reduction \$131.5M) as a result of DoD related budgetary adjustments.

5) MILCON reflects funding reductions of \$651.1M within the FYDP (FY 2015 - FY 2019) as a result of continued Air Force working group refinements. These refinements include site surveys for initial bases, knowledge gained since contract award, and the removal of planning and design requirements.

The reduction to the program funding of \$1,361.6M in "To Complete" is explained as follows:

- 1) As a result of the acceleration of five aircraft into the FYDP, the out-years beyond FY 2019 were reduced by \$1,013.9M as the aircraft total procurement will not exceed the original 175 production aircraft.
- 2) MILCON reductions of \$347.7M beyond FY 2019 are due to continued refinement in requirements as a result of the Air Force working group.

Quantity	Undistributed	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
Development	4	0	0	0	0	0	0	0	0	4
Production	0	0	0	7	12	18	17	15	106	175
PB 2015 Total	4	0	0	7	12	18	17	15	106	179
PB 2014 Total	4	0	0	7	12	15	15	15	111	179
Delta	0	0	0	0	0	3	2	0	-5	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding TY\$

3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
2005	--	--	--	--	--	--	10.2
2006	--	--	--	--	--	--	10.1
2007	--	--	--	--	--	--	67.8
2008	--	--	--	--	--	--	16.7
2009	--	--	--	--	--	--	17.8
2010	--	--	--	--	--	--	305.1
2011	--	--	--	--	--	--	538.9
2012	--	--	--	--	--	--	818.9
2013	--	--	--	--	--	--	1550.3
2014	--	--	--	--	--	--	1558.6
2015	--	--	--	--	--	--	776.9
2016	--	--	--	--	--	--	606.4
2017	--	--	--	--	--	--	316.8
2018	--	--	--	--	--	--	21.6
2019	--	--	--	--	--	--	4.4
Subtotal	4	--	--	--	--	--	6620.5

Annual Funding BY\$

3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2011 \$M	Non End Item Recurring Flyaway BY 2011 \$M	Non Recurring Flyaway BY 2011 \$M	Total Flyaway BY 2011 \$M	Total Support BY 2011 \$M	Total Program BY 2011 \$M
2005	--	--	--	--	--	--	11.4
2006	--	--	--	--	--	--	10.9
2007	--	--	--	--	--	--	71.6
2008	--	--	--	--	--	--	17.3
2009	--	--	--	--	--	--	18.2
2010	--	--	--	--	--	--	307.7
2011	--	--	--	--	--	--	533.4
2012	--	--	--	--	--	--	796.5
2013	--	--	--	--	--	--	1481.3
2014	--	--	--	--	--	--	1464.5
2015	--	--	--	--	--	--	717.0
2016	--	--	--	--	--	--	548.9
2017	--	--	--	--	--	--	281.1
2018	--	--	--	--	--	--	18.8
2019	--	--	--	--	--	--	3.8
Subtotal	4	--	--	--	--	--	6282.4

Annual Funding TY\$
3010 | Procurement | Aircraft Procurement, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
2015	7	1320.1	--	--	1320.1	262.6	1582.7
2016	12	1975.1	--	--	1975.1	451.7	2426.8
2017	18	3044.9	--	--	3044.9	727.2	3772.1
2018	17	3016.8	--	--	3016.8	674.6	3691.4
2019	15	2705.4	--	--	2705.4	611.3	3316.7
2020	15	2761.4	--	--	2761.4	593.0	3354.4
2021	15	2830.4	--	--	2830.4	577.1	3407.5
2022	15	2897.3	--	--	2897.3	492.3	3389.6
2023	15	2959.2	--	--	2959.2	561.0	3520.2
2024	15	3018.7	--	--	3018.7	491.5	3510.2
2025	13	2711.8	--	--	2711.8	326.3	3038.1
2026	12	2604.2	--	--	2604.2	330.2	2934.4
2027	6	1474.1	--	--	1474.1	175.5	1649.6
Subtotal	175	33319.4	--	--	33319.4	6274.3	39593.7

Annual Funding BY\$
3010 | Procurement | Aircraft Procurement, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2011 \$M	Non End Item Recurring Flyaway BY 2011 \$M	Non Recurring Flyaway BY 2011 \$M	Total Flyaway BY 2011 \$M	Total Support BY 2011 \$M	Total Program BY 2011 \$M
2015	7	1183.0	--	--	1183.0	235.3	1418.3
2016	12	1735.4	--	--	1735.4	396.9	2132.3
2017	18	2623.0	--	--	2623.0	626.4	3249.4
2018	17	2547.8	--	--	2547.8	569.7	3117.5
2019	15	2240.0	--	--	2240.0	506.2	2746.2
2020	15	2241.5	--	--	2241.5	481.4	2722.9
2021	15	2252.5	--	--	2252.5	459.3	2711.8
2022	15	2260.5	--	--	2260.5	384.1	2644.6
2023	15	2263.6	--	--	2263.6	429.1	2692.7
2024	15	2263.8	--	--	2263.8	368.6	2632.4
2025	13	1993.8	--	--	1993.8	239.9	2233.7
2026	12	1877.1	--	--	1877.1	238.0	2115.1
2027	6	1041.7	--	--	1041.7	124.0	1165.7
Subtotal	175	26523.7	--	--	26523.7	5058.9	31582.6

Annual Funding TY\$
3300 | MILCON | Military Construction, Air Force

Fiscal Year	Total Program TY \$M
2012	8.6
2013	--
2014	250.0
2015	145.4
2016	39.2
2017	181.0
2018	265.3
2019	342.6
2020	34.5
2021	449.3
2022	256.4
2023	368.2
2024	386.3
2025	273.4
2026	103.7
2027	37.3
2028	10.9
Subtotal	3152.1

Annual Funding BY\$
3300 | MILCON | Military Construction, Air
Force

Fiscal Year	Total Program BY 2011 \$M
2012	8.2
2013	--
2014	227.3
2015	129.7
2016	34.3
2017	155.1
2018	223.0
2019	282.3
2020	27.9
2021	355.8
2022	199.1
2023	280.3
2024	288.3
2025	200.0
2026	74.4
2027	26.2
2028	7.5
Subtotal	2519.4

The KC-46 MILCON efforts presently include Air Force (3300 Appropriation), the Air National Guard (3830 Appropriation) and the Air Force Reserve Command (3730 Appropriation).

Annual Funding TY\$
3830 | MILCON | Military Construction, Air
National Guard

Fiscal Year	Total Program TY \$M
2015	41.9
2016	2.8
2017	1.5
Subtotal	46.2

Annual Funding BY\$
3830 | MILCON | Military Construction, Air
National Guard

Fiscal Year	Total Program BY 2011 \$M
2015	37.6
2016	2.5
2017	1.3
Subtotal	41.4

Annual Funding TY\$
3730 | MILCON | Military Construction, Air
Force Reserve

Fiscal Year	Total Program TY \$M
2018	48.1
Subtotal	48.1

Annual Funding BY\$
3730 | MILCON | Military Construction, Air
Force Reserve

Fiscal Year	Total Program BY 2011 \$M
2018	40.5
Subtotal	40.5

Air Force Reserve Command MILCON is being reported for the KC-46 Program for the first time in the FY 2015 PB.

Low Rate Initial Production

	Initial LRIP Decision	Current Total LRIP
Approval Date	2/24/2011	2/24/2011
Approved Quantity	19	19
Reference	Milestone B ADM	Milestone B ADM
Start Year	2015	2015
End Year	2016	2016

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the fact that KC-46 Milestone B Acquisition Decision Memorandum (ADM) approves a LRIP quantity of 19 aircraft as being necessary to develop an incremental quantity increase to Full Rate Production.

Foreign Military Sales

In February 2013, the Air Force received a Letter of Request (LOR) from Japan for price and availability information on the KC-46A. Deputy Under Secretary of the Air Force for International Affairs prepared a response, and the United States Embassy in Japan Mutual Defense Assistance Office provided a verbal response to the Japanese government. The Program Office is anticipating a secondary LOR to include additional details; however, a timeline is unknown.

Although the program does not have any current FMS, in addition to the Japanese LOR, the program has received interest from South Korea, and the Strategic Tanker Consortium from Europe in FMS/Direct Commercial Sales of the aircraft.

The Program Office is not currently aware of any Security Issues.

Nuclear Costs

None

Unit Cost

Unit Cost Report

	BY2011 \$M	BY2011 \$M	
Unit Cost	Current UCR Baseline (AUG 2011 APB)	Current Estimate (DEC 2013 SAR)	BY % Change

Program Acquisition Unit Cost (PAUC)

Cost	43518.2	40466.3	
Quantity	179	179	
Unit Cost	243.118	226.069	-7.01

Average Procurement Unit Cost (APUC)

Cost	33040.3	31582.6	
Quantity	175	175	
Unit Cost	188.802	180.472	-4.41

	BY2011 \$M	BY2011 \$M	
Unit Cost	Original UCR Baseline (AUG 2011 APB)	Current Estimate (DEC 2013 SAR)	BY % Change

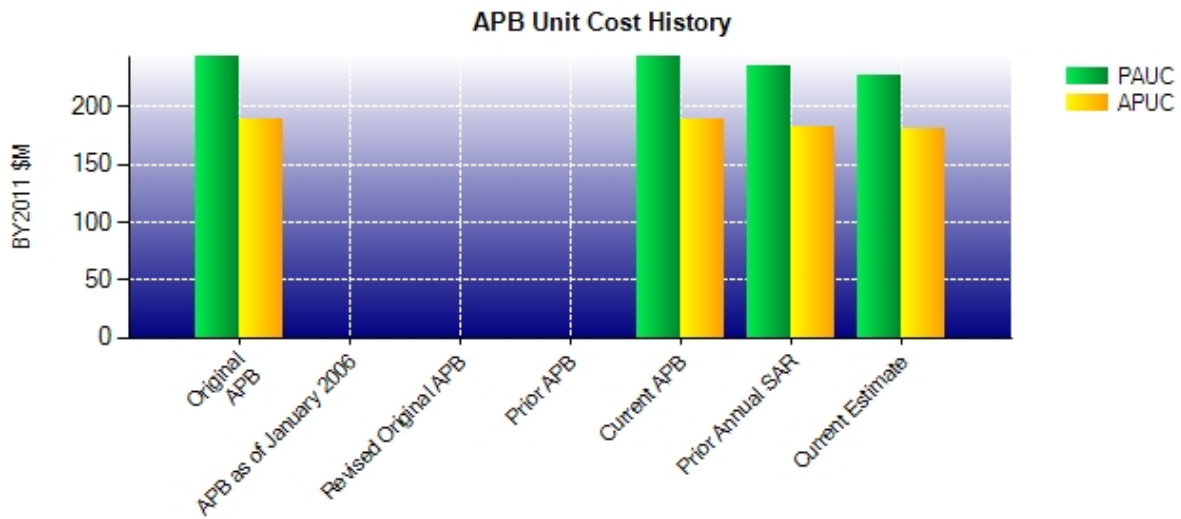
Program Acquisition Unit Cost (PAUC)

Cost	43518.2	40466.3	
Quantity	179	179	
Unit Cost	243.118	226.069	-7.01

Average Procurement Unit Cost (APUC)

Cost	33040.3	31582.6	
Quantity	175	175	
Unit Cost	188.802	180.472	-4.41

Unit Cost History



	Date	BY2011 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	AUG 2011	243.118	188.802	288.828	229.920
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	N/A	N/A	N/A	N/A	N/A
Current APB	AUG 2011	243.118	188.802	288.828	229.920
Prior Annual SAR	DEC 2012	234.832	182.627	288.503	230.408
Current Estimate	DEC 2013	226.069	180.472	276.316	226.250

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)

Initial PAUC Dev Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
288.828	8.665	0.000	-0.881	0.000	-18.062	0.000	-2.234	-12.512	276.316

Current SAR Baseline to Current Estimate (TY \$M)

Initial APUC Dev Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
229.920	7.743	0.000	-0.901	0.000	-8.275	0.000	-2.237	-3.670	226.250

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	FEB 2011	N/A	FEB 2011
Milestone C	N/A	AUG 2015	N/A	AUG 2015
RAA	N/A	AUG 2017	N/A	AUG 2017
Total Cost (TY \$M)	N/A	51700.2	N/A	49460.6
Total Quantity	N/A	179	N/A	179
Prog. Acq. Unit Cost (PAUC)	N/A	288.828	N/A	276.316

Cost Variance

Summary Then Year \$M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	7149.6	40236.0	4314.6	51700.2
Previous Changes				
Economic	+97.4	+1504.5	+171.8	+1773.7
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-147.1	-1138.3	-235.5	-1520.9
Other	--	--	--	--
Support	-30.1	-280.8	--	-310.9
Subtotal	-79.8	+85.4	-63.7	-58.1
Current Changes				
Economic	-54.6	-149.4	-18.7	-222.7
Quantity	--	--	--	--
Schedule	--	-157.7	--	-157.7
Engineering	--	--	--	--
Estimating	-416.4	-309.9	-985.8	-1712.1
Other	--	--	--	--
Support	+21.7	-110.7	--	-89.0
Subtotal	-449.3	-727.7	-1004.5	-2181.5
Total Changes	-529.1	-642.3	-1068.2	-2239.6
CE - Cost Variance	6620.5	39593.7	3246.4	49460.6
CE - Cost & Funding	6620.5	39593.7	3246.4	49460.6

Summary Base Year 2011 \$M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	6804.2	33040.3	3673.7	43518.2
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	+0.3	--	-53.4	-53.1
Engineering	--	--	--	--
Estimating	-121.7	-881.9	-197.5	-1201.1
Other	--	--	--	--
Support	-30.4	-198.6	--	-229.0
Subtotal	-151.8	-1080.5	-250.9	-1483.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-389.9	-284.8	-821.5	-1496.2
Other	--	--	--	--
Support	+19.9	-92.4	--	-72.5
Subtotal	-370.0	-377.2	-821.5	-1568.7
Total Changes	-521.8	-1457.7	-1072.4	-3051.9
CE - Cost Variance	6282.4	31582.6	2601.3	40466.3
CE - Cost & Funding	6282.4	31582.6	2601.3	40466.3

Previous Estimate: December 2012

RDT&E	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	-54.6
Adjustment for current and prior escalation. (Estimating)	+32.7	+34.5
Decrease in FY 2013 funding due to Sequestration reductions. (Estimating)	-136.6	-142.9
Decrease in FY 2015 and FY 2018 funding as a result of risk reduction given program's stable execution and no Engineering Change Proposals. (Estimating)	-108.6	-119.6
Decrease in FY 2013 funding due to Congressional reductions. (Estimating)	-75.9	-79.4
Decrease Aircrew Training Systems funding in FY 2015 and FY 2018 due to competitively awarded contract. (Estimating)	-40.5	-44.4
Decrease in FY 2013 funding due to Small Business Innovation Research. (Estimating)	-41.1	-43.0
Decrease in FY 2015 - 2019 as a result of DoD budget adjustments. (Estimating)	-18.2	-20.0
Revised Program Office Estimate to reflect program realignments resulting from execution changes. (Estimating)	-1.7	-1.6
Increase in Direct Mission Support cost due to execution changes. (Support)	+19.9	+21.7
RDT&E Subtotal	-370.0	-449.3

Procurement	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	-149.4
Acceleration of procurement buy profile from FY 2025 - FY 2026 to FY 2017 - FY 2018. A total of 5 additional aircraft will be purchased through this Future Years Defense Program (FYDP). (Schedule)	0.0	-157.7
Decrease in FY 2015 - FY 2018 funding as a result of risk reduction given the Program's continued stable execution and no Engineering Change Proposals to date. (Estimating)	-469.2	-536.0
Revised estimate to reflect the application of new outyear inflation indices. (Estimating)	+280.1	+337.5
Decrease in FY 2015 - FY 2019 as a result of DoD budget adjustments. (Estimating)	-95.7	-111.4
Decrease in Other Support: (Subtotal)	-95.4	-100.3
Non quantity related impacts include (1) Reduction of Aircrew Training Systems funding to align with competitively awarded contract in May 2013; impacts FY 2015 - 2018. (2) Rephasing of Interim Contract Support in FY 2015 - FY 2016 to align with contract option prices. (3) Rephase and realignment of Depot Stand-Up costs resulting from refined depot activation strategy; impacts FY 2015 - FY 2026. (4) Revised estimate to reflect the application of new outyear escalation indices. (Support)	(-127.4)	(-131.7)
Increase in Other Support resulting from accelerated procurement of 5 additional aircraft within the FYDP. (Support) (QR)	(+32.0)	(+31.4)
Change in Initial Spares: (Subtotal)	+3.0	-10.4
Non quantity related reflects revised estimate to reflect the application of new outyear escalation indices. (Support)	(+8.9)	(+10.8)
Quantity related adjustments to the accelerated procurement of 5 additional aircraft within the FYDP. (Support) (QR)	(-5.9)	(-21.2)

Procurement Subtotal -377.2 -727.7

(QR) Quantity Related

MILCON	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	-18.7
Adjustment for current and prior escalation. (Estimating)	+2.3	+2.5
Reduced funding to reflect continuing Air Force working group refinements to include site surveys for initial bases and knowledge gained (Air Force). (Estimating)	-598.3	-715.4
Revised Program Office estimate to reflect removal of planning and design funding, budgeted elsewhere in the Air Force from FY 2014 - FY 2024. (Estimating)	-219.7	-268.8
Increase in funding as a result of Main Operating Base # 3 facility projects (Air Force Reserve Command). (Estimating)	+40.6	+48.1
Revised estimate to reflect continuing Air Force working group refinements resulting from site surveys for initial bases and knowledge gained. Impacts FY 2015 - FY 2017 (Air National Guard). (Estimating)	-41.6	-46.5
Decrease in FY 2014 funding due to Congressional reductions. (Estimating)	-13.0	-14.3
Increase in FY 2012 funding as a result of below threshold reprogramming. (Estimating)	+8.2	+8.6
MILCON Subtotal	-821.5	-1004.5

Contracts

Appropriation: RDT&E

Contract Name **KC-46 Engineering and Manufacturing Development**
 Contractor The Boeing Company
 Contractor Location 7755 E Marginal Way S
 Seattle, WA 98108-4002
 Contract Number, Type FA8625-11-C-6600/1, FFP
 Award Date February 24, 2011
 Definitization Date February 24, 2011

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
66.6	N/A	N/A	68.7	N/A	N/A	68.7	68.7

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to a contract modification, accomplished on January 14, 2013 adding \$2.1M to the Firm Fixed Price (FFP) contract. The modification was processed for Contract Line Item Number 0003 (Studies). This modification increased the target and negotiated price of the FFP contract from \$66.6M to \$68.7M.

Cost and Schedule Variance Explanations

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

Appropriation: RDT&E

Contract Name **KC-46 Engineering and Manufacturing Development**
 Contractor The Boeing Company
 Contractor Location 7755 E Marginal Way S
 Seattle, WA 98108-4002
 Contract Number, Type FA8625-11-C-6600, FPIF
 Award Date February 24, 2011
 Definitization Date February 24, 2011

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
4327.3	4831.0	4	4327.3	4831.0	4	4831.0	4831.0

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (3/20/2014)	-170.4	-362.2
Previous Cumulative Variances	-73.3	-18.2
Net Change	-97.1	-344.0

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to a number of delays related to the Boom Aerial Refueling, Program Planning and Management, Aerial Refueling Operator Station, and Drogue Aerial Refueling program elements. The increased engineering design and integration complexities of the main aerial refueling systems have required more engineering and program management resources than planned.

The unfavorable net change in the schedule variance is due to several areas within the program.

The first relates to how Boeing Commercial Aircraft (BCA) is reported in the Earned Value Management Systems. BCA (largest sub-contractor for Engineering and Manufacturing Development (EMD)) efforts are now being measured based on earned value milestone "0-100 percent" methodology, versus incremental progress along the way. This new methodology created a large negative schedule variance (89 percent of the cumulative variance reported) when the 767-2C effort missed a Power On milestone in December 2013. As soon as Power On takes place, that portion of the variance will be recouped. The Program Office is currently working with the Defense Contract Management Agency - Seattle office to assess the validity of this reporting methodology.

Additionally, schedule variances for the Boom/Drogue Aerial Refueling elements and the Aerial Refueling Operator Station are rooted in design and integration issues, as well as, late deliveries from subcontractors. The System Test and Evaluation program elements have also incurred late System Integration Lab deliveries from subcontractors, but are also being impacted by delayed test integration design plans for wiring, fabrication, and assembly requirements.

General Contract Variance Explanation

Earned value data is as of February 27, 2014 and was reported to the KC-46 Program Office on March 20, 2014.

Contract Comments

The Contractor's current Estimated Price at Completion reflects the existing contract scope.

The Program Manager's (PM) Estimated Price at Completion on the Fixed Price Incentive Firm (FPIF) contract for EMD remains at the contract ceiling price of \$4,831M. The Contractor's Estimated Price at Completion for EMD is set at the ceiling price of \$4,831M. The Contractor's current Estimated Cost at Completion (EAC) is \$5,096.9M. The Government's liability is limited to the contract ceiling price of \$4,831M on this FPIF contract.

While the Government's liability is limited to the contract ceiling price of \$4,831M, the KC-46 Program Office accomplished their second annual life cycle cost estimate in December 2013 to include this FPIF contract. The PM's EAC has increased from a most likely of \$5,615M to a most likely of \$5,864M. This increase in the PM's EAC is the result of incorporating cost risks from the May 2013 Integrated Risk Assessment conducted between the KC-46 Program Office and Boeing. Again, this increase in the PM's EAC has no impact to the Government's liability and does not create a need for additional funding to the EMD efforts.

Appropriation: RDT&E

Contract Name **KC-46 Aircrew Training Systems - Engineering and Manufacturing Development**
 Contractor FlightSafety Services Corporation
 Contractor Location 10770 E. Briarwood Ave. Suite 100
 Centennial, CO 80112-3807
 Contract Number, Type FA8621-13-C-6247/0, FPIF
 Award Date May 01, 2013
 Definitization Date May 01, 2013

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price at Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
70.9	79.1	N/A	70.9	79.1	N/A	70.9	79.1

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/21/2014)	0.0	0.0
Previous Cumulative Variances	--	--
Net Change	+0.0	+0.0

Cost and Schedule Variance Explanations

None

General Contract Variance Explanation

The program implemented a phased approach to the Integrated Baseline Review process. Initial phase was the completion of required documents by the contractor; the second phase will be traceability and resource loading within the Integrated Master Schedule and related Earned Value Management documentation as well as final document reviews. The final phase will be to conduct Cost Account Manager interviews and establish the Performance Management Baseline (PMB), by the end of April 2014.

Amounts reported are the contract values in effect from the initial May 1, 2013 contract award. No contract modifications impacting costs have been made at this time.

Contract Comments

This is the first time this contract is being reported.

The current contractor estimate at complete (EAC) is based on the target price.

The Program Manager's EAC is based on the contract ceiling. The government's liability is limited to the contract ceiling price.

Accurate cost and schedule variances will be reported pending the establishment of the PMB. Monthly variances for cost and schedule are explained in the contractor's Format 5 reporting; however, they have not updated their EAC since contract award and thus Earned Value analysis is incomplete.

The Aircrew Training System contract (FA8621-13-C-6247) has a secondary effort (01) which is a Firm Fixed Price contract and does not meet the reporting criteria for the annual SAR. The effort has a target price of \$7.5M and does not require earned value reporting.

Deliveries and Expenditures

Delivered to Date	Plan to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	4	0.00%
Production	0	0	175	0.00%
Total Program Quantity Delivered	0	0	179	0.00%

Expended and Appropriated (TY \$M)

Total Acquisition Cost	49460.6	Years Appropriated	10
Expended to Date	3047.6	Percent Years Appropriated	41.67%
Percent Expended	6.16%	Appropriated to Date	5153.0
Total Funding Years	24	Percent Appropriated	10.42%

The above data is current as of 2/28/2014.

Operating and Support Cost

KC-46A

Assumptions and Ground Rules

Cost Estimate Reference:

In support of the Milestone B decision in February 2011, the Air Force developed a Service Cost Position (SCP). The Milestone Decision Authority approved baselining the KC-46 Program to this SCP. In December 2013, the KC-46 Division accomplished an update to this SCP in its second annual Program Office Estimate (POE). Total O&S costs reported in this SAR reflect this POE update.

Sustainment Strategy:

The KC-46A product support strategy supports 168 Primary Aircraft Authorized (PAA) for a 40-year service life and will use logistics support concepts that emphasize increased availability and a reduced logistics footprint, supported by the current United States Air Force (USAF) maintenance and logistics support structure. The product support strategy will use a Contractor Supported Weapons System concept during Engineering and Manufacturing Development transitioning to 100 percent organically managed/performance-based logistics posture as soon as viable during production. The KC-46A will be maintained as a Federal Aviation Administration certified aircraft at least during Interim Contractor Support. A Sustainment Strategy Decision at Milestone C, based upon a business case analysis, will determine the long-term sustainment strategy. The USAF has identified the three Air Logistics Complexes as the locations for the organic depots.

Antecedent Information:

KC-135R&T is the antecedent system.

KC-135R&T costs have been normalized to reflect the average of 670 annual flying hours per aircraft in the KC-46 POE. KC-135R&T average annual cost per aircraft reflects actual FY 2013 costs reported in the Air Force Total Ownership Cost system (budget constrained). Most FY 2013 costs reflect the current state of KC-135R&T; however, there are a few exceptions, such as modification costs in Continuing System Improvements, where the FY 2013 KC-135R&T costs are lower than in previous years.

Unitized O&S Costs BY2011 \$M		
Cost Element	KC-46A Average Annual Cost per Aircraft	KC-135R&T (Antecedent) Average Annual Cost per Aircraft
Unit-Level Manpower	4.400	3.100
Unit Operations	4.100	3.900
Maintenance	3.100	3.500
Sustaining Support	0.400	0.100
Continuing System Improvements	0.900	0.100
Indirect Support	0.000	0.000
Other	0.000	0.000
Total	12.900	10.700

Unitized Cost Comments:

KC-46A costs shown in comparison with actual costs for the antecedent system, KC-135R&T, reflect estimated average annual cost per aircraft. KC-46A costs are from the December 2013 POE.

Total KC-46A O&S cost is not a simple extrapolation of the KC-46A average annual cost per aircraft shown in the preceding "Unitized O&S Costs BY2011\$M" table. The "Unitized O&S Costs" comparison above excludes "Indirect Support" costs because these costs are not allocated to KC-135R&T-specific Program Elements in the Air Force Total Ownership Cost (AFTOC) system. However, these costs are included in the KC-46A Total O&S POE (average annual cost per aircraft of \$2.2M Base Year 2011 \$) in order to estimate Total O&S costs for KC-46A.

Total KC-46A Aircraft O&S (BY 2011\$M) = [unitized cost (\$12.9M) x 40 operational aircraft years x 168 PAA] + Total O&S Indirect Support costs (excluded from the unitized cost comparison above to allow for a normalized comparison) + phase-in and phase-out costs (as aircraft are fielded and later retired).

KC-135R&T costs have been normalized to reflect the average of 670 annual flying hours per aircraft in the KC-46 POE. The KC-46A average annual cost per aircraft assumes full funding of the program's requirements (unconstrained); whereas the KC-135R&T average annual cost per aircraft reflects actual FY 2013 costs reported in the AFTOC system (budget constrained). Most FY 2013 costs reflect the current state of KC-135R&T; however there are a few exceptions, such as modification costs in Continuing System Improvements, where the FY 2013 KC-135R&T costs are lower than in previous years. While this comparison is to FY 2013 actual KC-135R&T costs, the Air Force projects KC-135R&T O&S costs to increase, surpassing projected KC-46A O&S costs by FY 2020. This projected increase is not reflected in the "Unitized O&S Costs BY 2011 \$M" table above. This comparison is also not adjusted for the capability differences that exist between the two systems nor does it recognize the cost savings that may be realized due to the commerciality of the KC-46A aircraft (the KC-46A is derived from a commercial Boeing 767 variant). Because the 767 was designed to be cost competitive in the commercial marketplace, it is anticipated that the aircraft's commercial efficiencies will facilitate improvement in the military operational costs for the KC-46A. In addition, the KC-46A has significantly more aerial refueling offload capability per aircraft compared to the KC-135R&T and is a multi-role aircraft with significant secondary missions associated with airlift and aeromedical evacuation. The KC-46A can also provide boom/drogue refueling on the same sortie, and has enhanced net ready and survivability capabilities.

Total O&S Cost \$M				
Current Development APB Objective/Threshold		Current Estimate		
	KC-46A	KC-46A	KC-135R&T (Antecedent)	
Base Year	92720.6	101992.7	103603.1 ¹	N/A
Then Year	182877.7	N/A	189687.5	N/A

¹ APB O&S Cost Breach

Total O&S Costs Comments:

KC-46 total O&S cost (\$M) in the "Total O&S Cost \$M" table above reflects the December 2013 POE total O&S costs for FY 2016 - FY 2069. This total O&S cost is not a simple extrapolation of the KC-46 average annual cost per aircraft shown in the preceding "Unitized O&S Costs BY2011 \$M" table. The KC-46 POE reflects the following assumptions: 168 PAA, 40-year service life, steady state beginning in FY 2029, and peacetime operations tempo with average annual flying hours of 489 hours per PAA through FY 2019, and 670 hours per PAA from FY 2020 and beyond. The KC-46 POE is based on legacy fleet history where KC-46A specific data is not available. A comparable total O&S cost for the antecedent system, KC-135R&T, is not available.

To maximize the benefits of KC-46A capabilities, Air Mobility Command has initiated operational and basing strategies to exploit its full capability and to leverage that capability across the total force. KC-46A delivers an increased capability (fuel offload, multi-role, survivability, etc.) that will allow the Air Force to better support joint and coalition warfighter/humanitarian requirements. In order to maximize KC-46A effectiveness and efficiency, an improved basing strategy with increased Total Force Associations and an increased flying hour program will be required to meet KC-46A aircrew readiness requirements of 3.5 crew ratio and receiver aircraft mission needs. This flying hour program is now estimated at 670 hours per aircraft per year beginning in FY 2020. These operational changes result in an increase to KC-46 O&S costs of 11.7 percent above the original plan put in place at Milestone B. This cost increase is not due to aircraft design performance, which remains unchanged. The Air Force is not projecting any increase to its top line budget; the increased KC-46A manpower and flying hours will be addressed by repurposing KC-135 personnel and flying hours. While the Air Force expects to gain efficiencies, the magnitude of those efficiencies is affected by numerous factors to include: the rate at which KC-135 aircraft are replaced by the KC-46A, Concept of Operations, training requirements, and basing strategy/crew ratio. The effects will be better known with future definition of these factors. The Air Force is committed to staying within its Total Obligation Authority in the transition from the KC-135 to the KC-46A.

O&S Cost Variance		
Category	Base Year 2011 \$M	Change Explanation
Prior SAR Total O&S Estimate (December 2012)	103,090.536	
Cost Estimating Methodology	0.000	
Cost Data Update	-681.133	Refinements to the following estimate areas: engine overhauls, depot c-checks, simulator support, and installation/personnel support.
Labor Rate	-38.032	Overall decrease in labor rates.
Energy Rate	0.000	
Technical Input	+619.654	Added other Operational Material to estimate
Programmatic / Planning Factors	+612.054	Accelerate the start of Modification funding from FY 2028 to FY 2020. Paint estimate and beddown schedule refinements.

Refinements to Sustaining Engineering strategy.	
Other	0.0
Total Changes	+512.543
Current Estimate	103,603.079

Disposal Costs:

Disposal costs, while not part of overall O&S costs, are a part of the life-cycle cost of the system. The KC-46 December 2013 Program Office Estimate (POE) included an estimate for these disposal costs.

The POE assumed that upon retirement at the end of the 40-year service life, each KC-46A aircraft would enter flyable storage at the Aircraft Maintenance and Regeneration Group and will be disposed after a period of five years. The total cost associated with disposal of the KC-46A 179 aircraft fleet was estimated to be \$14.0M (BY 2011 \$).