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KC-46A TANKER MODERNIZATION (KC-46A)

Selected Acquisition Report (SAR)



AS OF THE FY 2023 PRESIDENT'S BUDGET
U.S. AIR FORCE

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Program Manager

Name: Col William Ottati

Date Assigned: May 20, 2021

Address: 3000 Presidential Drive,
Wright-Patterson Air Force Base, OH 45433

Phone: 781-225-5777

Mission and Description

The KC-46A Tanker Modernization (KC-46A) will replace the U.S. Air Force's aging fleet of Tankers which have been the primary refueling aircraft for more than 50 years. The KC-46A will have enhanced refueling capabilities with greater capacity, and both cargo and aeromedical evacuation with improved efficiency and increased capabilities. The KC-46A will provide aerial refueling support to the United States Air Force, Navy, and Marine Corps, as well as allied nation coalition aircraft.

The KC-46A will have the ability to refuel any fixed-wing receiver capable aircraft on any mission. The KC-46A will be equipped with a modernized KC-10 refueling boom integrated with a fly-by-wire control system, and will be capable of delivering a fuel offload rate required for large aircraft. Furthermore, a hose and drogue system will add additional mission capability which will be independently operable from the refueling boom system. The centerline drogue and wing aerial refueling pods (WARPs) will be used to refuel aircraft fitted with probes. All KC-46A aircraft will be configured for the installation of a Multi-Point Refueling System capable of refueling two receiver aircraft simultaneously from the WARPs mounted under the wings. One Aerial Refueling Operator will control the boom, centerline drogue, and WARPs during refueling operations. Panoramic displays will provide the Aerial Refueling Operator with wing-tip to wing-tip situational awareness.

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

The aircrew compartment will include 15 permanent seats for aircrew, which will include permanent seating for the Aerial Refueling Operators and an optional Aerial Refueling Instructor.

Two high-bypass turbofans, mounted under 34-degree swept wings, will power the KC-46A to take off at gross weights up to 415,000 pounds.

Executive Summary:

Significant Developments Since last Report

KC-46A Remote Vision System (RVS): KC-46A System Program Office (SPO) and Boeing continue to work toward resolution of two CAT-1 Deficiency Reports (DRs) related to the RVS. The fleet-wide release of the software-only Enhanced Remote Vision System update, along with the first retrofit, was accomplished in December 2021. On RVS 2.0, the joint team continues to work known risks with the Detect, Recognize, Identify (DRI) and Covert Operations requirements. Preliminary Design Review (PDR) was held in May 2021 with 14 action items and three critical action items identified. The three critical action items must be closed to support PDR Exit Criteria. Those three critical action items are 1) RVS 2.0 Training Package, 2) Identify Electromagnetic Environment Certification/Tempest Aircraft to support Amended Type Certificate(ATC), Supplemental Type Certification, and Military Flight Release certification test, and 3) Smart acceleration Agreements. The joint team has completed the three Technical Coordination Memorandums to have the critical action items ready for closure, pending senior leader discussion/review.

Official PDR closure occurred on April 11, 2022, the KC-46A contract will be modified with the RVS 2.0 Product Baseline Design Specification, which will outline the RVS 2.0 configuration baseline. Senior leader engagements between Boeing, Air Mobility Command (AMC), and SAF/AQ were conducted July-December 2021 to support exploring the covert and DRI risks and associated tradeoffs. The Boeing/SPO team provided technical, schedule, and cost impacts to support a multiple engagements between SAF/AQ and Boeing on the tradeoff and way forward to finalize the RVS 2.0 design and path to PDR closure. An Agreement in Principle between the USAF and Boeing was signed in November 2021 to establish a path forward on provisioning for a future panoramic sensor upgrade within the RVS 2.0 architecture. Engagements with SPO, SAF/AQ, AMC, and Boeing continue to work toward resolution of the final DRI solution.

KC-46A Boom Telescope Actuator Redesign (BTAR): The Program Office and Boeing continue to work toward resolution of the CAT-1 DR related to boom stiffness while in contact with receiver aircraft. PDR was held in February 2020, Critical Design Review (CDR) was held in September 2020, and BTAR Lab CDR was held in October 2020. The team conducted a lab test Technical Interchange Meeting authorizing Boeing to start developmental build-up testing. Lab actuator is delayed due to some component modifications required to address non-compliances and is now expected in 2nd Quarter 2022 for hardware in the loop testing.

Fuel Manifold Leaks: The Program Office and Boeing continue to work toward resolution of the CAT-1 Product Quality Deficiency Report (PQDR) related to excessive fuel leaks in the KC-46A aerial refueling manifold. 27 of the 53 delivered aircraft are affected. Some aircraft have returned for a second repair; Boeing has completed 34 total repairs on fielded aircraft. As a result of these fuel leaks Boeing has redesigned the KC-46A fuel manifold coupling seals to improve capability and maintainability. The team obtained Federal Aviation Administration (FAA) certification of the new seal design in August 2021 and released service bulletin 767-28-0153 authorizing the implementation of the V5 hybrid seal for the larger diameter aerial refueling and single point refueling manifolds. Boeing intends to implement the

new designs by individual section on an attrition basis; this approach is not desired as it will lead to multiple aircraft configurations and further complicate configuration management. Program office and AMC leadership will continue to meet with Boeing leadership to resolve the fuel manifold retrofit plan.

Aerial Refueling (AR) Receptacle Drain Line Tube Cracking: In May 2021, the Program Office adjudicated a CAT I PQDR for three known occurrences of AR drain tube cracks since January 2020 where water entered refueling receptacle fuel drain lines, froze, and caused cracking that allows fuel to leak when the KC-46A takes on fuel as a receiver. In October 2021, a Time Compliance Technical Order was released to the field outlining inspections to help reduce the probability of rupture. Boeing has determined the root cause, is working design changes to solve the issue, and expects a Service Bulletin, with instructions to retrofit delivered aircraft, will be published Fourth Quarter FY 2022. There are no operational restrictions on fielded KC-46s due to this deficiency, and it does not affect AMC's plan for KC-46A Interim Capability Release.

Auxiliary Power Unit (APU) Drain Masts: In January 2021, the KC-46A Program Office downgraded the APU Drain Mast CAT-1 DR to a CAT-2. The APU Drain Mast DR was downgraded since all the suspect masts with a limited life (<250 flight hours) had been replaced with new masts that had a predicted life of 900 flight hours. This configuration was expected to last until the final, full-life configuration was available. However, in April 2021, a CAT-1 DR was resubmitted when a crack was discovered on the new Drain Mast and damage to the APU Bay Door after only ~320 flight hours. There are no operational restrictions on fielded KC-46s due to this deficiency, and it does not affect AMC's plan for KC-46A Interim Capability Release. Boeing has indicated a new mast design and reinforcement kits for the APU door structure will be available for retrofit in FY 2022.

Flight Management System Instability: There are no significant software-related issues with this program at this time; however in May 2021, the Program Office adjudicated a CAT I PQDR regarding several isolated incidents of instability in the Flight Management System that caused a loss of lateral navigation. The program released interim procedural flight crew guidance, ensuring KC-46A crews know what to do should the issue recur as well as pre-flight procedure changes to mitigate the likelihood of occurrence. Boeing and GE have identified a root cause and are developing a long-term software fix, which is projected to be released to the field in September 2022. This software is certified as part of the FAA ATC and requires FAA certification. As is true with the other KC-46A PQDRs, this deficiency will be resolved under the fixed price development contract and thus does not drive significant costs or schedule delays to the KC-46A Program. There are no operational restrictions on fielded KC-46s due to this deficiency, and it does not affect AMC's plan for KC-46A Interim Capability Release.

Production: 94 Production and four Engineering and Manufacturing Development (EMD) KC-46A aircraft are on contract. 54 have been DD250'd and 53 have been delivered as of December 31, 2021 including the first two aircraft to Joint Base McGuire-Dix-Lakehurst. Of the remaining 44 aircraft yet to be DD250'd, 16 are in the supply system, 26 are in some stage of production, and two are supporting flight test at the Military Delivery Center (MDC). Of those 26 in production, 12 are in 767-2C build, 10 are undergoing KC-46A conversion, three are being stored in a partially-built configuration on the ramp at the Everett Delivery Center, and one aircraft is currently undergoing acceptance testing at the MDC.

As of December 31, 2021, 53 aircraft have been delivered; 21 to McConnell AFB, Kansas, 8 to Altus AFB, Oklahoma,

12 to Pease ANGB, New Hampshire, and 9 to AF Reserve Command, Seymour Johnson AFB, North Carolina and, 3 to Joint Base McGuire-Dix-Lakehurst (JBMDL).

Test: The remaining KC-10 (Tanker) and E-4B Aerial Refueling Certification sorties are likely to occur in early CY2022 based on Long-Term Test Aircraft availability. Electromagnetic Pulse passive system testing was completed at Patuxent River Naval Air Station in August 2021. The data set from the Naval Air Systems Command was received by Defense Threat Reduction Agency in December 2021. Results will drive active system test and direct drive test planning – follow-on testing is scheduled March 2022 at Patuxent River Naval Air Station. Flew an updated Radar Warning Receiver (RWR) Operational Flight Program at China Lake in October 2021, successfully demonstrating a fix issues found during flight test. Formal integrated Developmental Test/Operational Test RWR flight testing will continue in early 2022.

Sustainment: In December 2021 the Industry Steering Committee (ISC) Chairman completed review and approved the USAF and Japan 767-2C Supplemental Type Certificate Maintenance Planning Documents. A top priority for the Supply team is all efforts pertaining to Logistics Reassignment (LR.) The team is actively monitoring the status of cataloging data corrections on the remaining 500+ National Stock Numbers (NSN) from initial baseline established with Boeing. As for repairable NSNs, the Logistics Reassignment Transfer Team (LRTT) has submitted 544 NSNs for LR, of which 460 have an Effective Transfer Dates assigned through January 1, 2022. The LRTT continues their efforts of reviewing/validating the remaining 1,254 repairable NSNs that were submitted for LR. The Program Office, Defense Logistics Agency, and 424th Supply Chain Management Squadron remain fully confident the initial baseline of aircraft parts identified by Boeing will complete LR by June 2022.

Depot activation: Depot activation planning continued across four lines of effort: aircraft, propulsion, commodity, and software activations. The first year of Organic Depot on a new FAA-certified A/C was an amazing success; on September 29, 2021 the last scheduled aircraft for FY 2021 was sold ahead of schedule. FY 2022 C-Checks are going to plan at Tinker AFB with three of 17 sold as of December 31, 2021. Two aircraft are processing through Depot Maintenance and are on schedule. On the Commodity activation front, Life Support Systems will be the first Commodities activated at WR-ALC beginning in December 2021. Propulsion activation support strategy remains on plan – Initial Contractor Logistics Support to new engine contract (In work) with transition ~2030 to organic pending engine depot gap analysis studies. New engine sustainment bridge contract will award April 2022. The Software Sustainment Organic Capability Standup program is on target to build and establish an end-to-end, organic depot-level software maintenance capability at OC-ALC by the spring of 2026 which will support the KC-46A aircraft's unique software baseline.

Training: The KC-46A Aircrew Training System (ATS) program delivered 1 Weapon System Trainer to McConnell AFB and 1 Pilot Part Task Trainer to Seymour Johnson AFB. In June 2021, the program initiated the Formal Training Unit (FTU) training at McConnell and Seymour Johnson AFBs, enabling critically needed aircrew training to be conducted at home station. The program continues to field Increment I capabilities via Update #1 and Update #2 on the Boom Operator Trainer (BOT) was certified September 17, 2021 and on the and Weapon Systems Trainer (WST) on October 6, 2021. FTU training began at Pease AFB in July 2021.

The KC-46A MTS program is currently in EMD, progressing toward the completion/acceptance of 7 Augmented Hardware Training Devices (AHTD) by September 2022 to McConnell AFB.

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	Significant Development Description
February 2011	The USD(AT&L) conducted a successful Milestone B DAB.
February 2011	The USD(AT&L) signed the APB reflecting the Milestone B approval.
February 2011	The Boeing Company was awarded the KC-46A contract. The Fixed-Price Incentive Firm contract was awarded for the EMD program phase, with Firm-Fixed-Price contract options for Low Rate Initial Production Lots 1 and 2, and Not-to-Exceed contract options with Economic Price Adjustment for Full Rate Production Lots 3 through 13.
November 2011	The KC-46A Program Office and Boeing successfully concluded the System Functional Review (SFR). The KC-46A SFR assessed the allocation and traceability of all program requirements from the System Specification to lower-level hardware and software requirements.
December 2011	Boeing conducted a non-contractual KC-46A Firm Configuration review—an internal Boeing commercial best practice. The KC-46A Firm Configuration validated that the aircraft configuration is sufficiently mature and stable to initiate detailed design of the militarized KC-46A tanker.
April 2012	The KC-46A Preliminary Design Review (PDR) was successfully completed. The Government and Boeing successfully completed the first step of a two-step PDR process on March 21-22, 2012, which consisted of a detailed review of the 89 contractual entrance criteria to PDR. The second step, conducted April 23 - 27 2012, consisted of a detailed review of the eight exit criteria and completion of all subsystem PDRs to Government satisfaction.
June 2012	Deputy Assistant Secretary of Defense, Systems Engineering, validated successful completion of PDR.
July 2013	The KC-46A Program successfully completed the planned Weapon System CDR 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. All action items were complete, and the Weapon System CDR was officially closed on August 21, 2013, one month ahead of the contractual requirement of September 24, 2013.
September 2013	The KC-46A Aircrew Training Systems (ATS) conducted a System Requirement Review and SFR.
September 2015	EMD-2 completed a major milestone, KC-46A First Flight.
November 2015	EMD-2 deployed the boom and both drogue systems in flight for the first time.
January 2016	EMD-2 completed the first KC-46A aerial refueling by offloading 1,600 pounds of fuel to an F-16C.
February 2016	EMD-2 completed fuel transfer with F/A-18 aircraft.
February 2016	EMD-2 completed KC-10 fuel transfer conducted with KC-46A as a receiver.
May 2016	MDA notified of Milestone B APB schedule breach to Initial Operational Test and Evaluation (IOT&E) Start.
June 2016	KC-46A ATS successfully completed full system CDR.
July 2016	EMD-4 completed fuel transfer to the F-16C, C-17A, and A-10C aircrafts with the boom axial load fix in-place.

August 2016	Program accomplished Milestone C.
December 2016	Boeing delivered new KCR-0800 schedule, Required Assets Available slipped to October 2018.
December 2017	Federal Aviation Administration (FAA) issued KC-46A Amended Type Certificate.
September 2018	FAA issued KC-46A Supplemental Type Certificate.
November 2018	Air Force issued Military Flight Release for KC-46A.
November 2018	Completed flight testing of eight receiver aircraft for aerial refueling certification.
December 2018	Received approval of F-16, C-17, and KC-46A (receiving fuel from a KC-135) receiver certifications.
January 2019	Air Force accepted first KC-46A aircraft on January 10, 2019.
January 2019	First KC-46A aircraft delivery to McConnell Air Force Base (AFB) January 25, 2019.
February 2019	First KC-46A aircraft delivery to Altus AFB February 8, 2019.
February 2019	February 2019 KC-46A deliveries halted due to Foreign Object Debris (FOD) issues at Boeing.
April 2019	Air Force resumed KC-46A deliveries after Boeing implemented additional corrective actions and finalized a FOD Corrective Action Plan with the government.
May 2019	The KC-46A Program began dedicated operational test with AFOTEC's execution of the IOT&E Test Plan.
August 2019	First KC-46A aircraft delivery to Pease Air National Guard Base August 8, 2019.
October 2019	Operational Test Readiness Review approved and IOT&E Start schedule milestone achieved.
March 2020	Due to COVID-19, Boeing temporarily suspended operations at production facilities until April 2020
April 2020	USAF and Boeing signed Remote Vision System (RVS) 2.0 memorandum of agreement establishing architecture to resolve CAT-I DRs on April 2, 2020.
June 2020	Formal notification of schedule breach to Full Rate Production Decision (FRPD) milestone signed on June 7, 2020.
June 2020	First KC-46 delivery to AF Reserve Command, Seymour Johnson AFB, on June 12, 2020.
September 2020	Boom Telescope Actuator Redesign Engineering Change Proposal definitized on September 30, 2020.
September 2020	Air Force's first-ever organic depot maintenance of an FAA-certified aircraft commenced September 10, 2020, when the first KC-46 was inducted into organic "C-Check" maintenance at Tinker AFB, OK.
October 2020	A revised APB was signed on October 19, 2020 updating the objective and threshold dates for the Full Rate Production Decision (FRPD) and Required Assets Available (RAA) milestone.
December 2020	The KC-46 Program conducted a RVS 2.0 System Requirements Review December 10-11, 2020.
May 2021	The KC-46 Program conducted a RVS 2.0 Preliminary Design Review May 25-27, 2021.
July 2021	Received approval for F-35B and F-35C receiver certifications (both via centerline drogue).
October 2021	First FMS KC-46A aircraft delivery with ferry to Japan on October 28, 2021.
November 2021	First KC-46A aircraft delivery to Joint Base Maguire-Dix-Lakehurst, New Jersey on November 9, 2021.

Schedule

Schedule Events

Schedule Events					
Events	Initial Production APB	Current APB Production			Current Estimate/Actual
		Category/Objective/Threshold			
Milestone B and Contract Award	Feb 2011	MS B	Feb 2011	Feb 2011	February 24, 2011
Milestone C	Aug 2016	MS C	Aug 2016	Aug 2016	August 12, 2016
IOT&E Start	Nov 2017	IOT&E	Oct 2019	Oct 2019	October 22, 2019
RAA ^{1, 2}	Oct 2018	IOC	Sep 2021	Mar 2022	Sep 2021
FRP Decision ³	Aug 2019	FRP	Mar 2024	Sep 2024	Jul 2024

Schedule Notes:

The KC-46 Program began dedicated operational test with Air Force Operational Test and Evaluation Center's execution of the IOT&E Test Plan in May 2019. The IOT&E Start milestone occurred on October 22, 2019, with formal approval of the Operational Test Readiness Review.

1/ Required Assets Available (RAA) is being used as a surrogate for Initial Operating Capability. RAA is defined as 18 aircraft meeting the final product baseline established at Physical Configuration Audit, two spare engines delivered, and nine ship sets of wing aerial refueling pods in place.

2/ An updated APB RAA Objective/Threshold was submitted, and SAF/AQ approved in a revised APB on October 19, 2020.

3/ A new FRP Decision current estimate was submitted and SAF/AQ approved in a revised APB on October 19, 2020.

Significant Schedule Risks

Significant Schedule and Technical Risks	
Current Estimate (December 2021)	
1.	If Wing Aerial Refueling Pod (WARP) 40 year System Type Certificate Federal Aviation Administration Supplemental Type Certificate (STC) extends beyond March 22, THEN the program will exceed the March 2022 APB threshold for RAA due to not having nine WARP shipsets delivered.
2.	If Moog's baseline qualification schedule is delayed, THEN there may be a delay to IOT&E completion.

Performance

Performance Characteristics				
Development APB Objective	Current APB Development Objective/Threshold	Demonstrated Performance (include Date of Demonstration)	Current Estimate or Actual	
Tanker Air Refueling Capability				
The aircraft should be capable of accomplishing air refueling of all current and programmed fixed-wing and 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. The aircraft shall be able to effectively conduct (non-simultaneously) both boom and drogue air refuelings on the same mission. While engaged, the KC-46A should 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 and tilt rotor receiver aircraft.	The aircraft should be capable of accomplishing air refueling of all current and programmed fixed-wing and 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. The aircraft shall be able to effectively conduct (non-simultaneously) both boom and drogue air refuelings on the same mission. While engaged, the KC-46A should 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 and tilt rotor receiver aircraft.	The aircraft should be capable of accomplishing air refueling of all current and programmed fixed-wing and 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. The aircraft shall be able to effectively conduct (non-simultaneously) both boom and drogue air refuelings on the same mission. While engaged, the KC-46A should 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.	SVR was conducted in 1QCY19 confirming non-compliance with requirements in the aerial refueling system specific to the Remote Vision System (RVS). Redesign efforts are currently underway to improve functionality of RVS to meet Critical Performance Parameters in order to resolve non-compliances. At completion, we will provide demonstrated performance for this KPP.	Will meet or exceed Current APB Threshold.
Fuel Offload versus Radius				
The aircraft shall be capable, as a minimum, of an offload versus radius as depicted in Figure 5.1; exceed offload/radius as depicted in Figure 5.1. Radius is defined as standard day takeoff, fly to the AR track, orbit for	The aircraft shall be capable, as a minimum, of an offload versus radius as depicted in Figure 5.1; exceed offload/radius as depicted in Figure 5.1. Radius is defined as standard day takeoff, fly to the AR track, orbit for one	The aircraft shall be capable, as a minimum, of an offload versus radius as depicted in Figure 5.1. Radius is defined as standard day takeoff, fly to the AR track, orbit for one hour, offload fuel, and return to original base	An SVR Update was held on 13 December 2020; SVR closure is not expected until the end of Q2FY22.	Will meet or exceed Current APB Threshold.

Performance Characteristics				
Development APB Objective	Current APB Development Objective/Threshold	Demonstrated Performance (include Date of Demonstration)	Current Estimate or Actual	
one hour, offload fuel, and return to original base with required reserve fuel. Aircraft should operate with maximum fuel efficiency within current aviation technology, without any degradation to mission/aircraft performance.	hour, offload fuel, and return to original base with required reserve fuel. Aircraft should operate with maximum fuel efficiency within current aviation technology, without any degradation to mission/aircraft performance.	with required reserve fuel. Aircraft should operate with maximum fuel efficiency within current aviation technology, without any degradation to mission/aircraft performance.		
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 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 shall be capable of worldwide flight operations at all times in 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.	(T=O) Aircraft shall be capable of worldwide flight operations at all times in 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.	An SVR Update was held on 13 December 2020; SVR closure is not expected until the end of Q2FY22.	Will meet or exceed Current APB Threshold.
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 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	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 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	(T=O) 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 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	Completed the ground mobility demonstration, proving the ability to accommodate various configurations of 463L pallets, aero-medical patient support pallets, and passenger pallets. The ability to use material	Will meet or exceed Current APB Threshold.

Performance Characteristics				
Development APB Objective	Current APB Development Objective/Threshold		Demonstrated Performance (include Date of Demonstration)	Current Estimate or Actual
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.	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.	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.	handling equipment and processes employed by AMC on other airlift aircraft was also completed.	
Receiver Air Refueling Capability				
The aircraft must be capable of receiver air refueling (IAW current technical directives) to its maximum inflight gross weight from any compatible tanker aircraft using current air refueling procedures.	The aircraft must be capable of receiver air refueling (IAW current technical directives) to its maximum inflight gross weight from any compatible tanker aircraft using current air refueling procedures.	The aircraft must be capable of receiver air refueling (IAW current technical directives) from any compatible tanker aircraft using current air refueling procedures.	An SVR Update was held on 13 December 2020; SVR closure is not expected until the end of Q2FY22.	Will meet or exceed Current APB Threshold.
Force Protection				
Aircraft shall be able to operate in chemical and biological environments.	Aircraft shall be able to operate in chemical and biological environments.	(T=O) Aircraft shall be able to operate in chemical and biological environments.	An SVR Update was held on 13 December 2020; SVR closure is not expected until the end of Q2FY22.	Will meet or exceed Current APB Threshold.
Net-Ready				
The KC-46 Program Office will provide installed performance values to the Joint Interoperability Test Command at the Operational Test Readiness Review upon completion of developmental testing and evaluation. These installed performance values will facilitate JITC's joint interoperability certification during Initial Operational Testing and Evaluation. The NR-KPP shall be satisfied following a performance assessment of the system	The KC-46 Program Office will provide installed performance values to the Joint Interoperability Test Command at the Operational Test Readiness Review upon completion of developmental testing and evaluation. These installed performance values will facilitate JITC's joint interoperability certification during Initial Operational Testing and Evaluation. The NR-KPP shall be satisfied following a performance assessment of the system capability as	(T=O) The KC-46 Program Office will provide installed performance values to the Joint Interoperability Test Command at the Operational Test Readiness Review upon completion of developmental testing and evaluation. These installed performance values will facilitate JITC's joint interoperability certification during Initial Operational Testing and Evaluation. The NR-KPP shall be satisfied following a performance assessment	An SVR Update was held on 13 December 2020; SVR closure is not expected until the end of Q2FY22.	Will meet or exceed Current APB Threshold.

Performance Characteristics				
Development APB Objective	Current APB Development Objective/Threshold		Demonstrated Performance (include Date of Demonstration)	Current Estimate or Actual
capability as defined in the CPD NR- KPP attribute table.	defined in the CPD NR- KPP attribute table.	of the system capability as defined in the CPD NR- KPP attribute table.		
Survivability				
Aircraft Self-Protection Measures (SPM). Tanker aircraft shall be able to operate in hostile environments as discussed in section 2 and AFTTP 3-3.22B. SPM shall provide automated protection against IR threats as described in AMC Annex to LAIRCM ORD 314-92 dated 25 Jan 2001. SPM shall provide automated protection against radio frequency (RF) threats as described in the Advanced Situational Awareness and Countermeasures (ASACM) CDD, 22 May 06, with the exception of Reduction in Lethality values in Table 28. 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 countermeasures and DS to avoid potential threats as discussed in ASACM CDD. The aircraft system shall support use of existing night vision devices and laser eye protection devices. KC-46A must be capable of flying tanker tactical profiles as specified in	Aircraft Self-Protection Measures (SPM). Tanker aircraft shall be able to operate in hostile environments as discussed in section 2 and AFTTP 3-3.22B. SPM shall provide automated protection against IR threats as described in AMC Annex to LAIRCM ORD 314-92 dated 25 Jan 2001. SPM shall provide automated protection against radio frequency (RF) threats as described in the Advanced Situational Awareness and Countermeasures (ASACM) CDD, 22 May 06, with the exception of Reduction in Lethality values in Table 28. 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 countermeasures and DS to avoid potential threats as discussed in ASACM CDD. The aircraft system shall support use of existing night vision devices and laser eye protection devices. KC-46A must be capable of flying tanker tactical profiles as specified in MCM 3-1, Vol 22, AF Tactics, Training,	(T=0) Aircraft Self-Protection Measures (SPM). Tanker aircraft shall be able to operate in hostile environments as discussed in section 2 and AFTTP 3-3.22B. SPM shall provide automated protection against IR threats as described in AMC Annex to LAIRCM ORD 314-92 dated 25 Jan 2001. SPM shall provide automated protection against radio frequency (RF) threats as described in the Advanced Situational Awareness and Countermeasures (ASACM) CDD, 22 May 06, with the exception of Reduction in Lethality values in Table 28. 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 countermeasures and DS to avoid potential threats as discussed in ASACM CDD. The aircraft system shall support use of existing night vision devices and laser eye protection devices. KC-46A must be capable of flying tanker tactical profiles as specified in	SVR was conducted in 1QCY19 confirming non-compliance with requirements to meet Self Protection Measure specific to the RVS and use of LWIR in hostile environments. Redesign efforts are currently underway to improve functionality of RVS to meet Critical Performance Parameters in order to resolve non-compliances enabling LWIR functionality. At completion, we will provide demonstrated performance for KPP.	Will meet or exceed Current APB Threshold.

Performance Characteristics				
Development APB Objective	Current APB Development Objective/Threshold		Demonstrated Performance (include Date of Demonstration)	Current Estimate or Actual
MCM 3-1, Vol 22, AF Tactics, Training, Procedures (U), Jun 03 (S//NF). The aircraft shall be capable of takeoff, landing, and air refueling, as a tanker and receiver in an NVIS environment. The KC-46A fleet shall have EMP protection for flight-critical aircraft systems.	Procedures (U), Jun 03 (S//NF). The aircraft shall be capable of takeoff, landing, and air refueling, as a tanker and receiver in an NVIS environment. The KC-46A fleet shall have EMP protection for flight-critical aircraft systems.	MCM 3-1, Vol 22, AF Tactics, Training, Procedures (U), Jun 03 (S//NF). The aircraft shall be capable of takeoff, landing, and air refueling, as a tanker and receiver in an NVIS environment. The KC-46A 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.	(T=O) The aircraft shall be provisioned (including structural modifications, plumbing, electrical, etc.) for simultaneous multi-point drogue refueling.	An SVR Update was held on 13 December 2020; SVR closure is not expected until the end of Q2FY22.	Will meet or exceed Current APB Threshold.
Operational Availability				
Operational Availability (Ao) rate will be used as a primary, capstone measure for reliability, maintainability, availability and supportability. Ao measures the percent of aircraft available for tasking. Ao equals total aircraft inventory (TAI) less the number of depot possessed aircraft (including scheduled and unscheduled depot maintenance) less the number of aircraft that are not mission capable divided by TAI. Operational availability shall not be less than 80% and 89%.	Operational Availability (Ao) rate will be used as a primary, capstone measure for reliability, maintainability, availability and supportability. Ao measures the percent of aircraft available for tasking. Ao equals total aircraft inventory (TAI) less the number of depot possessed aircraft (including scheduled and unscheduled depot maintenance) less the number of aircraft that are not mission capable divided by TAI. Operational availability shall not be less than 80% and 89%.	Operational Availability (Ao) rate will be used as a primary, capstone measure for reliability, maintainability, availability and supportability. Ao measures the percent of aircraft available for tasking. Ao equals total aircraft inventory (TAI) less the number of depot possessed aircraft (including scheduled and unscheduled depot maintenance) less the number of aircraft that are not mission capable divided by TAI. Operational availability shall not be less than 80%	An SVR Update was held on 13 December 2020; SVR closure is not expected until the end of Q2FY22.	Will meet or exceed Current APB Threshold.
Reliability and Maintainability				
Reliability and Maintainability (R&M) shall be sufficient to	Reliability and Maintainability (R&M) shall be sufficient to	(T=O) Reliability and Maintainability (R&M) shall be sufficient to	An SVR Update was held on 13 December 2020;	Will meet or exceed Current

Performance Characteristics				
Development APB Objective	Current APB Development Objective/Threshold		Demonstrated Performance (include Date of Demonstration)	Current Estimate or Actual
generate, deploy, operate, sustain and recover the tanker in the conduct of operations to levels and degrees of readiness and performance as prescribed in 6.6.3 and 6.6.4. The aircraft will be designed with ease of maintenance, improved diagnostics and system reliability to minimize the support required.	generate, deploy, operate, sustain and recover the tanker in the conduct of operations to levels and degrees of readiness and performance as prescribed in 6.6.3 and 6.6.4. The aircraft will be designed with ease of maintenance, improved diagnostics and system reliability to minimize the support required.	generate, deploy, operate, sustain and recover the tanker in the conduct of operations to levels and degrees of readiness and performance as prescribed in 6.6.3 and 6.6.4. The aircraft will be designed with ease of maintenance, improved diagnostics and system reliability to minimize the support required.	SVR closure is not expected until the end of Q2FY22.	APB Threshold.

Requirements Reference

CPD for KC-135 Replacement Aircraft (KC-46A), R4.4 approved by JROC Memorandum (023-16), dated April 21, 2016, revalidated by JROC Memorandum (043-18), dated May 2, 2018.

Performance Notes

The Tanker AR Capability KPP objective requires the air refueling of all current and programmed fixed-wing receiver aircraft and the air refueling of all current and programmed tilt-rotor receiver aircraft. The ability to refuel at a maximum in-flight gross weight portion of this KPP objective was not included as one of the contractually-required 372 mandatory requirements.

Figure 5.1, as referenced in the objective and threshold values, is located in the CPD.

The KC-46A CPD references five KSAs. To maintain alignment with the approved Milestone B APB, only two have been referenced in the Milestone C update.

Development test is completed on the aircraft's LWIR cameras within the remote vision system. LWIR cameras are necessary for a KC-46A to perform as a tanker in a NVIS environment. LWIR performance was deemed unsatisfactory and conducting NVIS air refueling is prohibited until fixes are incorporated. Boeing has agreed to address the LWIR performance in the overall remote vision system improvements they are planning to incorporate

Acquisition Budget Estimate

Total Acquisition Cost

Category	Base Year	Development APB	APB Name (Current) (10/19/2020)		Budget Estimate PB 2023		Deviation
		Objective (BY\$)	Objective (BY\$)	Threshold (BY\$)	BY\$	TY\$	
RDT&E	2016	7,351.9	6,054.7	6,660.2	6,140.5	6,021.2	
Procurement	2016	35,699.9	30,897.3	33,987.0	28,117.1	33,016.8	
MILCON	2016	3,969.4	2,577.1	2,834.8	2,281.4	2,736.7	
Acq. O&M	2016						
Total		47,021.2	39,529.1	N/A	36,539.1	41,774.7	
PAUC	2016	262.688	220.833	242.916	204.129	233.378	
APUC	2016	203.999	176.556	194.212	160.669	188.668	

Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	4	4
Procurement	175	175

Budget Notes:

The total fleet quantity for the KC-46A Program is 179 aircraft, reflected in the FY 2023 PB. Four of these aircraft are funded with RDT&E dollars. The remaining aircraft are to be purchased using Procurement funds. Funding and quantities in this SAR reflect the FY 2023 PB submission, updated for OSD budget adjustments, fact-of-life changes, and reduced for FY22 marks. RDT&E reflects the updated FY23 PB execution plans for the Boom Telescope Actuator Redesign (BTAR) and Take-off and Landing Data (TOLD) efforts, as well as Government Test requirements. Procurement reflects the updated FY23 PB execution plans for aircraft and associated support elements for the revised aircraft buy quantity profile reflected in the FY23 PB. MILCON is updated to reflect reprogrammings to date and a rephase of requirements to align with the budget. There are no cost breach concerns for the program.

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (October 2020)	
1.	The CAPE ICE (August 10, 2016) identified the following risks at Milestone C: The Department has historically demonstrated limited ability to maintain stable requirements and limit changes to program technical baselines for complex weapon systems. Furthermore, the potential of engineering change introduces the possibility of opening the terms and conditions of the KC-46A contract, causing upward pressure on prices, even though the initial contract was awarded on a competitive basis.
2.	KC-46A annual procurements lots 3 through 13 include a 'Not to Exceed' (NTE) unit price with Economic Price Adjustment (EPA). The EPA is sensitive to relatively small changes in the contractual Producer Price Index.
3.	Final negotiation of annual procurement lot prices from the pre-priced NTE values.
4.	Analogous DoD programs have historically taken longer to establish an organic capability than the time estimated for KC-46A to transition from Interim Contractor Support.
5.	The procurement of annual quantities, other than the target quantity, introduces significant unit pricing penalties.
Original Baseline Estimate (August 2011)	
1.	The CAPE ICE (February 22, 2011) identified the following risks as Milestone B: (1) The Department has historically demonstrated limited ability to maintain stable requirements and limit changes to program technical baselines for complex weapon systems. Furthermore, the potential of engineering change introduces the possibility of opening the terms and conditions of the KC-46A contract, causing upward pressure on prices, even though the initial contract was awarded on a competitive basis. (2) The procurement of annual quantities, other than the target quantity, introduces significant unit pricing penalties.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2021)	
1.	Current procurement cost risks match current baseline.

Unit Cost

Current Baseline Compared with Current Estimate

Category (BY16\$M)	Current APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	39,529.1	36,539.1		
Quantity	179	179		
Unit Cost	220.833	204.129	-7.6%	None
APUC				
Cost	30,897.3	28,117.1		
Quantity	175	175		
Unit Cost	176.556	160.669	-9.0%	None

Original Baseline Compared with Current Estimate

Category (BY16\$M)	Original APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	47,021.2	36,539.1		
Quantity	179	179		
Unit Cost	262.688	204.129	-22.3%	None
APUC				
Cost	35,699.9	28,117.1		
Quantity	175	175		
Unit Cost	203.999	160.669	-21.2%	None

Contracts

Contract Data (\$TYM)		
Contract Number	FA8625-11-C-6600	
Effort Number	3	
Modification Number	P00267	
Contract Type	FFP	
Award Date	12/10/2014	
Definitization Date	9/15/2015	
Order Number		
CAGE Code/CAGE Legal Name	81205/The Boeing Company	
Contract Title	KC-46A Production	
Contract Address	Seattle, WA	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
119.4	15133.1	
Initial Ceiling Price	Current Ceiling Price	
N/A	N/A	
Contract's EAC	PM's EAC	
15133.1	15133.1	
Initial Quantity	Current Quantity	Delivered Quantity
175	175	50
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes

Cost and schedule variance reporting is not required on this Firm-Fixed Price (FFP) contract.

The following represents Contract Modification details:

P00166: On January 12, 2021, a contract modification was issued in the amount \$1,687,359,008 for the exercise of Production Lot 6 CLINs, 0601, 0603, 0618, 0619; and the definitization of Production Lot 7 CLINs 0701, 0703, 0718, 0719.

P00232: On January 20 2021, a contract modification was issued in the amount of \$2,124,531,149 for the exercise of Production Lot CLINs 0701, 0703, 0718, 0719 On March 3, 2021, a contract modification (P00239) was issued in the amount of \$2,213,873.52 to exercise option CLINs 0423 and 0424 for LSR support at McConnell AFB and Altus AFB. On April 16, 2021, a contract modification (P00241) was issued in the amount of \$890,006.14 for McConnell FSR Alignment, CLIN 0425 and Option CLIN 0525.

P00242: On April 8, 2021, a contract modification was issued to re-journal Lot 1 and Lot 5 aircraft. No change in price.

P00247: On May 25, 2021, a contract modification was issued in the amount of \$101,730,844.58 for ICS Option 5 exercise; LSR/FSR support for Seymour Johnson Option Exercise.

P00248: On June 9, 2021 a contract modification was issued de-obligating \$795,922.52 from CLINs 0325 and 0426. No change in price.

P00249: On June 14, 2021, a contract modification was issued to extend the delivery date for the RVS 2.0 R Sim.

P00234: On June 21, 2021, a contract modification was issued to update the SOW (rev Z), CDRLs (exhibits C/D), GFP list (attachment 42/43), and de-obligated \$803,093 from CLIN 0619. No change in price.

P00251: On June 30, 2021, a contract modification was issued to re-obligate \$803,093 to CLIN 0619. No change in price.

P00235: On July 1, 2021, a contract modification was issued in the amount of \$67,385,721.00 for the Lot 6 and Lot 7 Spares and Support Equipment effort.

P00254: On August 6, 2021, a contract modification was issued de-obligating \$8,862,654 from CLIN 0027. No change in price.

P00258: On August 26, 2021, a contract modification was issued for completion of contract activities for SVR update, Type 1 training, and pre-op support. No change in price.

P00256: On August 30, 2021, a contract modification was issued to update DoDAAC and Shipping information for the WARP kits. No change in price.

P00245: On September 14, 2021, a contract modification was issued for the KY-100M Military Type Certification. No change in price.

P00260: On September 15, 2021, a contract modification was issued in the amount of \$377,819.26 for LSR support for Pease Option Exercise.

P00261: On October 5, 2021, a contract modification was issued in the amount of -\$95,206.42 for the deobligation of cancelled funds on CLIN 0008.

P00262: On October 5, 2021, a contract modification was issued in the amount of \$95,206.42 for the obligation of current funds on CLIN 0008.

P00266: On November 8, 2021, a contract modification was issued in the amount of \$125,015.68 for Pease FSR and JBMDL LSR.

P00267: On December 17, 2021, a contract modification was issued in the amount of \$1,364,034.00 to establish and fund CLIN 0627 for Pease FSR II; CLIN 0630 for Joint Base McGuire-Dix-Lakehurst LSR II; and CLIN 1604 for CY22 License, Databases, and Subscription renewals.

Contract Data (\$TYM)		
Contract Number	FA8625-11-C-6600/01	
Effort Number	01	
Modification Number	P00208	
Contract Type	FFP	
Award Date	02/24/2011	
Definitization Date	02/24/2011	
Order Number		
CAGE Code/CAGE Legal Name	81205/The Boeing Company	
Contract Title	KC-46A Engineering and Manufacturing Development/Studies	
Contract Address	Seattle, WA	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
66.6	173.5	
Initial Ceiling Price	Current Ceiling Price	
N/A	N/A	
Contract's EAC	PM's EAC	
168.1	168.1	
Initial Quantity	Current Quantity	Delivered Quantity
0	0	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes

Cost and schedule variance reporting is not required on this Firm-Fixed Price (FFP) contract.

Contract Data (\$TYM)		
Contract Number	FA8621-13-C-6247	
Effort Number	1	
Modification Number	P00061	
Contract Type	FFP	
Award Date	5/1/2013	
Definitization Date	5/31/2017	
Order Number		
CAGE Code/CAGE Legal Name	7Y637/FlightSafety Services Corporation	
Contract Title	KC-46 Aircrew Training Systems - Production	
Contract Address	Centennial, CO	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
68.9	206.1	
Initial Ceiling Price	Current Ceiling Price	
N/A	N/A	
Contract's EAC	PM's EAC	
205.7	206.1	
Initial Quantity	Current Quantity	Delivered Quantity
71	71	31
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes

Quantities have been corrected to be accurate and consistent with the methodology used for other KC-46 contracts. Delivered quantities include devices that have been DD-250ed or accepted by the Government.

FFP Production OY6 exercised in March 31, 2021 \$33.02M.

The following represents Contract Modification details:

P00042: Migration of Windows 7 to Windows 10 Secure Host Baseline (SHB) ECP-002, April 29, 2021 for \$6.6M.PZ0050 Production OY6 Definitization. Total decrease -\$696,569.00.

P00061: KC-46 Aircrew Training System (ATS) Exercise Fuselage Trainer #8 Sprinkler Installation Option \$353,254.

Contract Data (\$TYM)		
Contract Number	FA8625-11-C-6600/02	
Effort Number	02	
Modification Number	P00237	
Contract Type	CPIF/CPFF	
Award Date	08/04/2019	
Definitization Date	09/30/2020	
Order Number		
CAGE Code/CAGE Legal Name	81205/The Boeing Company	
Contract Title	KC-46A Engineering and Manufacturing Development/BTAR	
Contract Address	Seattle, WA	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
55.5	105.4	
Initial Ceiling Price	Current Ceiling Price	
55.5	105.4	
Contract's EAC	PM's EAC	
94.0	108.9	
Initial Quantity	Current Quantity	Delivered Quantity
2	2	0
BAC	BCWP	ACWP
82.0	51.3	65.4
BCWS	Cost Variance	Schedule Variance
55.3	-14.1	-4.1

Contract Notes

Contractor and PM EACs represent Most Likely EACs.

The following represents Contract Modification details:

P00231: On February 1, 2021 contract modification was issued to obligate \$9,444,836.00 to CLIN 0027. This modification was also issued to update the BTAR IMP and Schedule Incentive Plan. Did not change price.

P00236: On February 11, 2021 contract modification was issued to de-obligate funds in the amount of \$5,394,792.00 on CLIN 0027. Did not change price.

P00237: On March 1, 2021 contract modification was issued to obligate \$5,394,792.00 in funds to CLIN 0026. This modification also updated the SOW, extended the Period of Performance for CLIN 0026 and added the wiring maintainability design effort to CLIN 0026. Increased Price to 105.4M.

P00254: On August 6, 2021, contract modification was issued to de-obligate funds in the amount of \$8,862,654 on CLIN 0027. Did not change price.

Cost Variance:

The unfavorable cumulative cost variance of -\$14.1M (-27.48%) is spread among many WBS elements, including: 1) WBS 2.1.3.1 Boom Hardware CLIN26 supplier Moog's continued effort towards closing out their Actuation Critical Design Review (CDR) and Test Equipment Preliminary Design Review (PDR), 2) WBS 2.1.3.2 Boom ACU additional effort required on drawings for the retrofit and production drawings, 3) WBS 2.1.3.3 Boom Electrical CLIN 26 unplanned Unit Member review efforts for review on certification acceptance of the drawings, & unplanned LOE support for USAF requests for additional

retrofit connection brakes in the wire bundle runs to reduce USAF field efforts in removing the boom, & defining final effectiveness of the production units, 4) WBS 2.2.1.1 Systems Engineering and Requirements Management CLIN 26 continuing regression analysis negotiations with the Boeing technical team and its USAF technical counterparts, 5) WBS 2.2.1.2 Software Planning and Control CLIN 27 LOE support, & CDR AI closure, L5 SRS update/release, L6 SDD update/release, initial S/W release for the BTAR lab, 6) WBS 2.2.1.7 System Safety review in CLIN 26 to its supplier documents and develop and release the Preliminary System Safety Assessment in support of the BTAR Critical Design Review (CDR), 7) WBS 2.2.1.8 Environment and Occupational Health CLIN 26 unexpected required deliverables in a different method than was previously used, & late supplier submittals which have driven a need to engage with additional reliability engineers, & post Critical Design Review actions to complete the review of the supplier reliability submittals and provide an updated Failure Mode and Effects Criticality Analysis (FMECA), 8) WBS 2.2.2.1 - Program Planning and Management continued charging of proposal preparation effort for CLIN 0027 and the aligning of all proposal cost that remained on the Company Funds Request (CFR) account collected on the CLIN 26 control account, 9) WBS 2.3.1.2 System Integration Laboratory (SIL) Ground Testing CLIN 27 Rate Variance and Efficiency Variance.

Schedule Variance:

The unfavorable cumulative schedule variance of -\$4.1M (-7.36%) is being driven primarily by WBS 2.1.3.1 - Boom Hardware CLIN27 rework and design changes in the Delivery Hardware Vendor NRE Manufacturing Readiness and Test Equipment IPT, specifically re-design and rework of the Power Design Unit (PDU) and Test Stand. In addition, Moogis experiencing resource constraints, specifically design engineers, due to retirements and other miscellaneous hiring constraints.

Contract Data (\$TYM)		
Contract Number	FA8621-16-C-6390/1	
Effort Number	01	
Modification Number	P00021	
Contract Type	FFP	
Award Date	07/06/2016	
Definitization Date	07/06/2016	
Order Number		
CAGE Code/CAGE Legal Name	81205/The Boeing Company	
Contract Title	KC-46 Maintenance Training System – Development	
Contract Address	St. Louis, MO	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price –	Current Target Price –	
45.4	46.4	
Initial Ceiling Price –	Current Ceiling Price –	
45.4	46.4	
Contract’s EAC	PM’s EAC	
46.4	46.4	
Initial Quantity	Current Quantity	Delivered Quantity
0	0	0
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

Contract Notes

The following represents Contract Modification details:

P00019: On March 15, 2021, contract modification awarded the total NTE amount of \$1,077,000

P00021: On August 16, 2021, contract modification awarded for KC-46 MTS Production Pricing - EMD Extension, SEPM CLIN Restructure, AddFAR 52.215-13 Alternate 1 (August 2020), ACRN AJ Admin Change

Technologies and Systems Engineering

Significant Technical Risks

Significant Technical Risks	
1.	IF Long Wave Infrared (LWIR) sensor does not provide adequate visual cues to enable boom aerial refueling operations, THEN boom aerial refueling operations will continue to be prohibited using LWIR.

Deliveries and Expenditures

Deliveries

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	4	4	4	100.00%
Production	61	50	175	28.57%
Total Program Quantity Delivered	65	54	179	30.17%

Total Expenditures and Appropriations (TY\$)

Total Acquisition Cost: 42,052.4 Expended to Date: 20,265.8

Percent Expended: 48.2%

Total Funding Years: 24

Years Appropriated: 18

Percent Years Appropriated: 75.00% Appropriated to Date: 26,167.2

Percent Appropriated: 62.23%

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	2/24/2011	10/20/20
Approved Quantity	19	118
Reference	Milestone B ADM	Milestone C and KC-46 Lot 6-9 ADM
Start Year	2015	2015
End Year	2016	2024

LRIP Note

In coordination with the Air Force, the Director, Operational Test and Evaluation decided KC-46 IOT&E will conclude after Remote Vision System deficiencies are resolved and the Air Force Operational Test and Evaluation Center has tested the KC-46 in its final production configuration. Conversion of Lots 6 through 9 to LRIP results in an increased LRIP quantity of 118 aircraft. Approved through Acquisition Decision Memorandum on October 20, 2020.

Operating and Support Costs

Total Program O&S Cost Compared with Baseline

	Current APB Objective (BY\$)	Current APB Threshold (BY\$)	Current Estimate (BY\$)	Current Estimate (TYS)	Deviation
Total O&S (\$Millions)	125,041.0	137,545.1	100,608.5	180,616.3	

O&S Cost Breakdown

Category (BY\$ Million)	KC-46A
Unit-Level Manpower	35,677.2
Unit Operations	19,121.7
Maintenance	32,016.3
Sustaining Support	7,340.8
Continued System Improvements	6,452.5
Other	
Total O&S	100,608.5

O&S Cost Notes

The KC- 46A Program has 166 Primary Aircraft Authorized and 13 back-up aircraft. The O&S estimate is based on 166 PAA. CY 2021 POE approved by Air Force Life Cycle Management Center/Cost and Economic Division (AFLCMC/FZC).