

## KC-46A Pegasus

### Executive Summary

- As of October 2020, the Air Force had accepted 38 of the expected 179 KC-46A aircraft.
- In support of the IOT&E, the program certified 9 of the 17 different receiver aircraft types for KC-46A aerial refueling and completed the required flight testing to support the certification of six additional receivers. B-2A testing is ongoing and A-10 testing has been deferred.
- The A-10 is anticipated to be certified for aerial refueling operations once the KC-46A stiff aerial refueling boom deficiency is resolved. The design resolution and implementation is anticipated to be complete in FY23.
- The program completed developmental testing of the wing aerial refueling pods (WARP), supporting the certification requirements that are expected to be finalized in mid-FY21.
- As of October 2020, the Air Force Operational Test and Evaluation Center (AFOTEC) had completed approximately 63 percent of all planned test points.
- In February 2020, AFOTEC conducted simulated aeromedical evacuation missions, which were followed by real aeromedical evacuation missions with live patients to Pacific and Atlantic bases outside the continental United States.
- In January 2020, AFOTEC resumed cargo missions following Boeing's correction of cargo pallet locks inadvertently unlocking during flight. Revamped cargo floor loading calculations, allowing efficient cargo pallet loading, have significantly improved cargo operations. However, forward barrier net limitations on cargo placement continue to hinder cargo operations.
- In coordination with the Defense Threat Reduction Agency and DOT&E, the Air Force developed a plan to test KC-46A against operationally realistic electromagnetic effects. Continuous wave testing was completed in November 2020 with electromagnetic pulse testing planned for May 2021.
- In May 2020, DOT&E decided not to issue an IOT&E report in support of a Full-Rate Production decision because the redesigned Remote Visual System (RVS) testing has not been completed. The redesigned RVS testing is anticipated to occur in FY23.

### System

- The KC-46A air refueling (AR) aircraft is the first increment of 179 replacement tankers for the Air Force fleet of more than 400 KC-135 and KC-10 tankers.
- The KC-46A design uses a modified Boeing 767-200ER commercial airframe with numerous military and technological upgrades, such as the fly-by-wire refueling boom, the remote air refueling operator's station, 787 cockpit displays,



additional fuel tanks in the body, and a range of survivability enhancement features:

- Susceptibility is reduced with an Aircraft Survivability Equipment suite consisting of Large Aircraft Infrared Countermeasures (LAIRCM), a modified version of the ALR-69A Radar Warning Receiver (RWR), and a Tactical Situational Awareness System (TSAS).
- Vulnerability is reduced by adding a fuel tank inerting system and integral armor to provide some protection to the crew and critical systems.
- The KC-46A will provide both a boom and probe-drogue refueling capabilities, and is also equipped with an AR receptacle so that it can receive fuel from other tankers, including legacy aircraft.
- The KC-46A is designed to have significant palletized cargo and aeromedical capacities; chemical, biological, radiological, and nuclear survivability; and the ability to host communications gateway payloads.

### Mission

Commanders will use units equipped with the KC-46A to perform AR in support of six primary missions: nuclear operations support, global strike support, air bridge support, aircraft deployment support, theater support, and special operations support. Commanders will use units equipped with the KC-46A to also accomplish the following secondary missions: airlift, aeromedical evacuation, emergency AR, air sampling, and support of combat search and rescue.

### Major Contractor

The Boeing Company, Commercial Aircraft in conjunction with Defense, Space & Security – Seattle, Washington

# FY20 AIR FORCE PROGRAMS

## Activity

- As of October 2020, the Air Force accepted 38 of 179 KC-46A aircraft at the following four air bases: McConnell AFB, Kansas; Altus AFB, Oklahoma; Pease AFB, New Hampshire; and Seymour Johnson AFB, North Carolina.
- In support of the IOT&E, the program completed aerial refueling certification of 9 of the 17 planned aircraft types to receive fuel from KC-46A (B-52, C-17A, C-130, F-15, F-16, F/A-18C/D, F/A-18E/F, KC-46A, F-35A). Flight testing to support certification of six additional receiver aircraft (B-1B, C-5M, CV/MV-22, E-3G, F-22A, P-8) is complete while B-2A testing is ongoing. The A-10 testing has been deferred and is awaiting the stiff boom redesign, which will not be completed until FY23.
- The Program Office completed developmental testing of the WARPs and expects to certify it in mid-FY21.
- AFOTEC continued execution of the IOT&E, which began in May 2019, in accordance with the DOT&E-approved test plan. As of October 2020, AFOTEC completed approximately 63 percent of all planned test points. AFOTEC cannot complete the remaining test points until the Air Force corrects deficiencies on the KC-46A.
- In November 2019, Boeing delivered a materiel correction for the deficiency where cargo pallet latches became inadvertently unlocked during flight. In December 2019, AFOTEC tested the new locking system, determined the problem had been resolved, and resumed cargo mission testing in January 2020.
- The Air Force conducted a flight test demonstration in June 2020 of the initial increment of a Boeing-proposed update to correct the major deficiency in the RVS of poor visual acuity. Boeing is working on an interim upgrade to the existing RVS system, Enhanced RVS, as well as a long-term redesign, designated as RVS 2.0. The KC-46A program currently projects flight testing RVS 2.0 in FY23.
- The Air Force conducted aeromedical evacuation missions with live patients to Pacific and Atlantic bases outside the United States in September and October 2020.
- The Air Force completed analyses to assess the KC-46A's inherent nuclear hardness to blast, radiation, flash, thermal, and electromagnetic pulse effects and to assess base safe escape in the event of a nuclear attack.
- The Air Force has coordinated with the Defense Threat Reduction Agency and DOT&E to develop a plan to test

KC-46A against operationally realistic electromagnetic effects. Continuous wave testing was completed in November 2020 with electromagnetic pulse testing planned for May 2021.

- AFOTEC completed the Cyber Vulnerability Penetration Assessment in October 2020 and conducted the cyber Adversarial Assessment in December 2020.
- Coronavirus (COVID-19) pandemic travel and operation restrictions suspended IOT&E flight test activity for approximately 90 days but, due to cascading effects on mission scheduling, the total delay in test point completion and cybersecurity test events is currently 4 months.

## Assessment

- Operational test data collection and analysis are ongoing, so there is no overall assessment at this time.
- Revamped cargo floor loading calculations, allowing efficient cargo pallet loading, have significantly improved cargo operations. However, forward barrier net limitations on cargo placement continue to hinder cargo operations.
- Because the Air Force will not conduct operational testing of a fully mission-capable RVS until FY23, DOT&E does not consider the current aircraft configuration to be completely production representative. Therefore, in May 2020, DOT&E informed the Assistant Secretary of the Air Force for Acquisition that DOT&E will not issue an IOT&E report in support of a Full-Rate Production decision until testing of the redesigned RVS is complete.
- Other long-term deferred test points include:
  - TSAS testing, pending RWR deficiency corrections anticipated in FY21
  - WARP operational testing pending completion of the developmental test report in mid-FY21
  - Boom refueling of light aircraft, such as the A-10, pending high boom stiffness corrections anticipated in mid-FY23

## Recommendation

1. The Air Force should continue to test and certify receiver aircraft to refuel from the KC-46A to support IOT&E receiver refueling evaluations.