

Research Brief

Addressing the Repair-or-Replace Dilemma in the Air Force's Aging Aircraft Fleets

Fiscal constraints have compelled the Air Force to keep some of its aircraft fleets in service for decades longer than originally intended. The cost of maintaining aging aircraft is substantial. Previous research by RAND Project AIR FORCE (PAF) has shown that maintenance costs rise and availability for missions decreases as aircraft grow older. Experience has also shown that aging aircraft can develop unforeseen problems such as wiring corrosion and other types of material degradation. The Air Force has addressed these problems through frequent inspections and service and through special renovation programs as needed. However, it now faces a long-term planning dilemma that centers on when to replace aging aircraft rather than to repair them.

PAF developed a model that compares the annual cost of repairing an older platform and the annualized cost of purchasing a new one to determine when replacement is optimal. Applying this model to two aging systems, the C-21A transport aircraft and the KC-135 tanker aircraft, the research team reached two principal conclusions:

- ***The Air Force should renovate the C-21A in 2012, as planned, and should retire the fleet around 2020.*** The C-21A is a Learjet used to transport high-ranking officials. The fleet is scheduled to undergo a 20,000 flight-hour renovation in the 2012 time frame to update key systems and to replace aging components. Although the renovation will temporarily increase the aircraft's costs, it will still be cost-effective for the Air Force to keep the C-21A in service until around 2020.
- ***The Air Force should replace the KC-135 fleet by 2010.*** The KC-135 is used for air refueling. The current fleet is more than 40 years old on average and has already shown considerable age-related problems. Given the estimated retirement date of 2010, the Air Force should begin the process of acquiring an appropriate replacement soon.

This model should help the Air Force make long-term plans for the repair and replacement of its cargo, tanker, and transport aircraft.

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