

# CH-47F Block II Chinook



**The CH-47F Block II Chinook accomplishes critical tasks across the operational environment including air assault, air movement, casualty evacuation, aerial recovery, and area resupply. Dialogue continues between Army leadership and members of Congress that will shape an updated acquisition strategy. The current Test and Evaluation Master Plan (TEMP) was approved 4QFY16 and will require an update when the Army's revised acquisition strategy is finalized.**

## SYSTEM DESCRIPTION

---

The CH-47 is the Army's tandem rotor cargo helicopter with a capacity to transport 31 combat-loaded troops. The CH-47F Block II retains the Chinook's legacy fiberglass rotor blades but includes a number of system improvements including an improved power train and rotor system, software and avionics upgrades, and a redesigned lightweight fuel system. The Army is in the process of changing the system described in the CH-47F TEMP that was approved in 4QFY16 as the CH-47F Block II. The program is moving away from the development of the Advanced Chinook Rotor Blades due to unresolvable vibration issues. The CH-47F Block II should be able to improve performance at lower altitudes and cooler temperatures using the fiberglass rotor blades. Current analysis shows that the CH-47F Block II will not be able to meet its performance requirements at high altitudes and in hot conditions in this configuration.

## MISSION

---

Units equipped with the CH-47F Block II will support the Army's heavy-lift mission in execution of full spectrum operations. The Chinook allows the Army to accomplish critical tasks across the operational environment including air assault, air movement, casualty evacuation, aerial recovery, and area resupply. The Chinook's range, speed, and lift

capacity allow for operational flexibility. Depending on mission requirements, the CH-47F can be employed individually, in multi-ship formations, or as a company.

## PROGRAM

---

The CH-47F Block II is an Acquisition Category IC program led by the Army's Program Executive Office Aviation at Redstone Arsenal, Alabama. The Milestone Decision Authority is the Army Acquisition Executive. The Army has not updated the program's TEMP since 4QFY16, and it is no longer valid due to numerous programmatic changes. The Army cancelled a Limited User Test scheduled for 2QFY21 that would have informed a subsequently cancelled Milestone C decision in 4QFY21.

DOT&E is awaiting an updated acquisition strategy and program content update (i.e., rotor blades, fuel cell, drive train, flight control system, avionics) in order to begin work on a revised test strategy and TEMP.

### » MAJOR CONTRACTOR

---

- The Boeing Co. – Ridley Park, Pennsylvania

## TEST ADEQUACY

---

The Army completed a CH-47F Chinook Block II cooperative vulnerability and penetration assessment (CVPA) at Redstone Arsenal, Alabama in 3QFY21. The CVPA was completed in

accordance with a DOT&E-approved test plan, and observed by DOT&E. The CVPA was well executed using an accredited system integration lab and a hangered aircraft. The CVPA was intended to support the cancelled 4QFY21 Milestone C decision.

The program executed post-ballistic testing of the CH-47F Block I and Block II synchronization shafts at Boeing, Ridley Park, Pennsylvania, in 1QFY22 to evaluate the survivability of these components following ballistic damage. Testing was completed in accordance with the DOT&E-approved test plan and under DOT&E observation. Testing was informed by prior static testing of the articles at Aberdeen Proving Ground, Maryland.

Following cessation of development of the Advanced Chinook Rotor Blades, DOT&E recommended dynamic ballistic testing of the legacy fiberglass rotor blades to assess survivability in accordance with program requirements. This testing was originally planned for 2003 but not executed when the CH-47 Ground Test Vehicle was destroyed in a maintenance event. The Program Office elected not to perform this testing in accordance with the DOT&E-approved TEMP and chose to concede aircraft vulnerability to the threat.

Despite the future of the CH-47F Block II program being uncertain, the program continues to conduct regular test strategy working groups to coordinate development and integration testing. The utility of these working groups is limited



due to the lack of a well-defined aircraft configuration, acquisition approach, and updated TEMP.

## PERFORMANCE

### » EFFECTIVENESS

The CH-47F Block II developmental testing using fiberglass rotor blades has seen some performance improvements attributed to the aircraft's improved power train and rotor system. The CH-47F Block II includes other system modernizations including software and avionics upgrades.

CH-47F Block II effectiveness will be assessed during future operational testing. Operational testing is not scheduled and should be included in the TEMP update.

### » SUITABILITY

CH-47F Block II suitability will be assessed during future operational testing. Operational testing is not scheduled and should be included in the TEMP update.

### » SURVIVABILITY

The CH-47F Block II should complete live-fire testing to assess aircraft survivability. The program has begun but not completed ballistic self-sealing tests on the new lightweight fuel system. The fuel cell failed qualification testing and experienced other issues during testing in FY21. The Program Office must decide on a path forward to address these issues and complete qualification and live fire testing.

The Army elected not to complete live-fire testing against the fiberglass rotor blades on the basis that regardless of the result, the Army would not change CH-47 tactics, techniques, or procedures. Due to the Program Office choosing not to perform rotor blade testing in accordance with the DOT&E-approved TEMP and conceding a CH-47 required threat, DOT&E must use preliminary data and assume the aircraft is vulnerable to the threat in the vulnerability analysis. This analysis will apply to both the CH-47F Block I and Block II as well as all other H-47 aircraft equipped with this blade.

DOT&E will work with the Army to schedule operational testing once a revised acquisition strategy emerges from the Army. DOT&E will publish a complete assessment of the CH-47F Block II's operational effectiveness, suitability, and survivability at the completion of operational testing.

## RECOMMENDATIONS

The Army should:

1. Complete a TEMP update to allow an assessment of test strategy adequacy.
2. Determine a path forward to address fuel cell survivability issues and execute testing in accordance with DOT&E-approved test plans.
3. Execute dynamic testing of the fiberglass rotor blade against the CH-47F required threat.