

# CH-53K King Stallion

The Marine Operational Test and Evaluation Squadron (VMX-1) began IOT&E on July 30, 2021. In accordance with the CH-53K Security Classification Guide, the interim assessment of CH-53K effectiveness, suitability and survivability is detailed in the Controlled Unclassified Information edition of this report. The report provides preliminary observations on CH-53K handling qualities in adverse flying conditions, load capacity, maintainability and reliability status as compared to the CH-53E as well the status of the CH-53K survivability key performance parameter. Final assessments of operational effectiveness, suitability, and survivability will be provided after the completion of IOT&E in February 2022.



## System Description

The CH-53K is a new-build, fly-by-wire, dual-piloted, three-engine, heavy-lift helicopter slated to replace the aging CH-53E. The CH-53K is designed to carry 27,000 pounds of useful payload (three times the CH-53E payload) over a distance of up to 110 nautical miles while maintaining a shipboard logistics footprint equivalent to that of the CH-53E. The Marine Air-Ground Task Force equipped with the CH-53K is intended to conduct heavy-lift missions, support forward arming and refueling, provide assault support in casualty evacuation, and conduct recovery and maritime special operations, as well as airborne control for assault support.

## Program

The CH-53K is an Acquisition Category IC program. DOT&E approved the Milestone C Test and Evaluation Master Plan (Revision C) in February 2017 and the Alternative LFT&E Strategy (Revision C) in May 2010. IOT&E started on July 30, 2021 and is intended to support the full-rate production decision scheduled for 2QFY23.

## Major Contractor

Sikorsky Aircraft (a Lockheed Martin subsidiary company) – Stratford, Connecticut.

## Test Adequacy

In FY21, the Integrated Test Team (ITT) completed sufficient developmental testing to support the start of IOT&E. The Marine Operational Test and Evaluation Squadron VMX-1 began IOT&E on July 30, 2021 with four System Development Test Articles that do not have the full defensive electronic countermeasure (DECM) system. DECM integrated testing with an EDM aircraft configured with a full DECM suite is planned for 2QFY22. FOT&E is planned with low-rate initial production Lot 2 aircraft to include the continuation of DECM testing and the evaluation of aircraft improvements.

Integrated and operational testing completed to date has been conducted in accordance with DOT&E-approved test plans. Cyber security testing is scheduled for February 2022.

In 3QFY20, the Navy resumed live-fire testing of CH-53K on the Ground Test Vehicle (GTV), starting with fuel cell and sponson testing against threshold threats under cruise and hover conditions. Phase II GTV testing of flight controls and the fuel and hydraulic systems began with on-board testing in November 2020 and was completed in March 2021. Phase III GTV testing to dynamically evaluate high-risk shots, including of gearboxes, structure, flight controls, the drive system, and the engine bay fire suppression system in a hover condition, began in May 2021 and completed in December 2021.

Live fire testing of the armor panels installed on the aircraft against operationally representative threats began in April 2021 and concluded in September 2021 with testing of the armored cockpit seats.

Tail rotor blade ballistic testing took place in December 2020. Sikorsky will endurance test the threat-damaged test articles to representative 30-minute fly-home loads in 2QFY22.

The Program Office has continued to defer Phase II of the LFT&E program until after initial operational

capability. Phase II of the LFT&E program is essential for a complete survivability assessment of the CH-53K against operationally relevant threats. This phase includes component tests for the main rotor assembly and tail rotor hub against threshold threats originally scheduled to support the Milestone C decision and additional components added or modified during aircraft development. While live fire testing to date has been conducted in accordance with DOT&E-approved LFT&E plans, Phase II live fire testing, defined in the DOT&E-approved Alternate LFT&E Strategy, has not yet been fully funded.

## Performance

In accordance with the CH-53K Security Classification Guide, the interim assessment of CH-53K effectiveness, suitability and survivability is detailed in the Controlled Unclassified Information edition of this report. The report provides preliminary observations on CH-53K handling qualities in adverse flying conditions, load capacity, maintainability and reliability status as compared to the CH-53E as well as the status of the CH-53K survivability key performance parameter.

## Recommendations

The Navy should:

1. Develop an FOT&E program to evaluate deployment capabilities that will not be tested in IOT&E.
2. Develop mitigations to address any design deficiencies identified in testing and plan to verify those mitigations in FOT&E.
3. Develop and fully fund Phase II of the LFT&E program as described in the DOT&E-approved LFT&E Strategy.