

MH-139A Grey Wolf



After several delays, the contractor obtained the third Federal Aviation Administration supplemental type certification (STC) required to support an initial military flight release. Four MH-139A aircraft were then transferred to the Air Force in August 2022 to begin government-led developmental flight testing. The current program schedule provides only a few months to collect operationally relevant data before the Milestone C decision, currently scheduled in January 2023. The MH-139A program needs to address several additional challenges to mitigate the risk to meeting operational effectiveness, suitability, and survivability requirements.

SYSTEM DESCRIPTION

The MH-139A Grey Wolf is a dual-piloted, twin-engine helicopter based on the commercial AW139 with added military capabilities in communication, navigation, identification, and survivability.

MISSION

The Air Force intends for the MH-139A to replace the UH-1N to provide rapid transport capability for two primary commands:

- Air Force Global Strike Command (AFGSC) will use the MH-139A to support the nuclear security missions by providing emergency security response and convoy escort at Minot AFB, North Dakota; Malmstrom AFB, Montana; and Francis E. Warren AFB, Wyoming.
- Air Force District of Washington (AFDW) will use MH-139A to provide contingency response, continuity of operations, and executive transport for senior government officials in the National Capital Region.

In addition, MH-139A-equipped units will conduct secondary missions for multiple commands:

- Air Force Materiel Command will provide test range support to Eglin AFB, Florida, and developmental test aircraft from Duke and Hurlburt Fields, Florida.

- Air Force Reserve Command will provide formal flight training at Maxwell AFB, Alabama.
- Air Education and Training Command will provide medical evacuation and support operations to the Air Force Survival School at Fairchild AFB, Washington.

All commands will perform search and rescue via the National Search and Rescue Plan and Defense Support to Civil Authorities.

PROGRAM

MH-139A is an Acquisition Category IB program. DOT&E approved the Milestone B Test and Evaluation Master Plan in June 2018 and the Alternative LFT&E Strategy in May 2019. In April 2021, the program reported an Acquisition Program Baseline breach to the Service Acquisition Executive, with a delay of the Milestone C decision beyond the threshold date of September 2021.

The MH-139A acquisition strategy relies on contractor flight-testing to obtain a series of civil STC approvals before the military flight release required for government-led developmental flight test. Three of eight STCs were required for the initial military flight release. The contractor gained the third STC approval in July 2022, and four test aircraft were transferred to the Air Force in August 2022. As a result, only a limited portion of testing will likely be accomplished before the Milestone C decision, currently scheduled in January 2023. DOT&E

and the Air Force Operational Test and Evaluation Center (AFOTEC) intend to provide reports to inform this decision. IOT&E is scheduled for late FY24 to support a Full-Rate Production decision in FY25.

» MAJOR CONTRACTOR

- Boeing Defense, Space & Security – Ridley Park, Pennsylvania

TEST ADEQUACY

The Air Force participated in contractor ground and flight testing at Duke Field, Florida, and at contractor facilities in Philadelphia, Pennsylvania. These tests supported the civil STC process, specification compliance, and airworthiness testing. The military utility of this phase of testing was limited.

Contractor testing focused on mitigating or removing contractor-imposed operating restrictions. Additional tests were conducted in September 2022 to evaluate performance at high density altitudes and high aircraft gross weights. These tests are necessary to validate the expanded operating envelope of the MH-139A. The crews using the MH-139A are expected to operate up to the edge of the allowed operating envelope, increasing the importance of the high-density-altitude tests for determining mission capability.

Government-led developmental flight testing began in August 2022, with planned demonstrations of military

subsystems, including the fast-rope insertion/extraction system bar, military communications, crew-served weapons, and the countermeasures dispensing system. Due to the limited time between the start of government-led flight testing and the Milestone C decision, there are limited opportunities to collect operationally representative performance data to inform the decision.

The Air Force published its seventh periodic report in January 2022, which summarized their observations from contractor testing and additional site visits to foreign government and law enforcement operators of the AW139. The Air Force will produce an interim summary report on all testing accomplished to date in accordance with a DOT&E-approved test concept to support the Milestone C decision.

The Air Force is executing live fire testing of all the aircraft components and subsystems described in the DOT&E-approved Alternative LFT&E Strategy. The Air Force conducted all testing in accordance with the DOT&E-approved test plans, and observed by DOT&E. The Air Force expects to perform full-scale dynamic testing for flight-critical subsystems during the next six months. Most testing is proceeding close to plan; however, persistent problems in acquiring technical data and some aircraft components from the contractor are delaying execution of some portions of the live fire test program.

DOT&E approved the electromagnetic pulse (EMP) test plan and reviewed a Program Office-developed plan to perform infrared signature testing to collect aircraft survivability data. The EMP testing is not currently scheduled due to negotiations with the contractor.

PERFORMANCE

» EFFECTIVENESS

MH-139A deficiencies identified in ground and flight testing to date continue to represent a risk to MH-139A meeting operational effectiveness requirements. Newly identified concerns include the certified envelope of the automatic flight control system not matching the expanded envelope of the aircraft, sensor display availability to the crew in the cabin, and intercommunication system deficiencies.

Concerns persist from the previous Annual Reports regarding the capability of the cabin layout to support employment of armed tactical response forces, as well as flight manual restrictions on takeoffs in crosswinds or near obstacles. The program is pursuing options to modify the cabin layout to support the tactical response forces and their required equipment while also working with AFGSC to update their concept of operations. International users of the AW139 recommended changes including the type of hoist, the location of the fast-rope insertion/extraction system bar, and other cabin configuration changes.

» SUITABILITY

The Program Office needs to address several challenges for the MH-139A to be operationally suitable. As reported in previous reports, expansion of the MH-139A operating envelope relative to the commercial AW139 baseline may stress powertrain components and increase maintenance requirements. AFOTEC collected observations from international users of the AW139 recommending routine corrosion-prevention measures to minimize long-term airframe maintenance. They also noted potential reliability shortfalls of the installed hoist system that the Air Force should monitor in testing. The contractor-provided mission planning system is not compatible with the Joint Mission Planning System and may not support current AFGSC and AFDW mission planning procedures.

» SURVIVABILITY

The Program Office needs to address several challenges for the MH-139A to be survivable against kinetic and electromagnetic threats. Ballistic testing of various components and subsystems has provided valuable information on the damage tolerance of the aircraft and will inform planned subsequent aircraft system-level assessments. The Air Force is preparing final test reports for completed component testing, along with plans for survivability and vulnerability analyses. DOT&E and the Air Force are reviewing cabin and cockpit armor protection against the specification threat and other operationally representative

small arms threats, at all relevant ranges.

The original contractor-proposed fuel cell design did not meet the required military standard for vendor qualification against a particular threat. The Program Office and AFGSC are evaluating a modified design to correct this deficiency.

RECOMMENDATIONS

The Air Force should:

1. Provide sufficient time for adequate government-led flight-testing before the Milestone C decision.
2. Execute the approved EMP test plan to assess aircraft survivability in expected

missions at the AFGSC and AFDW operating areas.

3. Address the performance of the armor and fuel system against ballistic threats.
4. Develop corrective action plans for deficiencies that affect operational requirements, including mission planning and cabin configuration.