

MH-139A Grey Wolf

Executive Summary

- The MH-139A Grey Wolf acquisition strategy relies on expanding existing civil flight certifications to obtain the military flight release required for government developmental test.
- Delays in the civil certification process have propagated to the remainder of the test program and may limit the information required to support the Milestone C decision.
- For most expected engagement conditions, the cockpit and cabin armor solution did not provide the required protection against the specification small arms threat.

System

- The MH-139A Grey Wolf is a dual-piloted, twin-engine helicopter that will replace the legacy UH-1N helicopter.
- Boeing is developing the MH-139A as a commercial derivative aircraft by integrating military communication, navigation, transponder, and survivability enhancement features to the baseline Leonardo AW139, including:
 - Cockpit and cabin armor
 - Self-sealing crashworthy fuel cells
 - AN/AAR-47 missile warning system and AN/ALE-47 countermeasures dispenser set
 - Two externally mounted M240 crew-served weapons
- The MH-139A is designed to accomplish 3 hours of unrefueled flight or a 225 nautical mile range, and a cruise speed of 135 knots.
- The MH-139A is intended to carry nine combat equipped troops and security response equipment.

Mission

- Air Force Global Strike Command 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 Washington will use MH-139A to provide contingency response, continuity of operations, and airlift for senior government officials in the National Capital Region.



- In addition, MH-139A-equipped units will conduct secondary missions for multiple commands:
 - Pacific Air Forces will provide operations support for key personnel based at Yokota Air Base, Japan.
 - Air Force Materiel Command will provide test range support to Eglin AFB, Florida, and developmental test aircraft from Duke and Hurlburt Fields, Florida.
 - Air Education and Training Command will provide formal flight training at Maxwell AFB, Alabama, and 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.

Major Contractor

The Boeing Company, Defense, Space, and Security – Ridley Park, Pennsylvania

Activity

- The MH-139A acquisition strategy relies on conducting the initial phases of flight test with the aircraft owned and operated by Boeing under a Civil Aircraft Operations (CAO) certification. Boeing will use the test events flown under the CAO to obtain a series of supplemental type certification (STC) approvals from the Federal Aviation Administration.
- The STC process has slipped over a year from the original plan of October 2019. Contractor flight testing to support STC approvals is ongoing at Duke Field, Florida, and contractor facilities in Philadelphia, Pennsylvania. The STCs required to support a military flight release (MFR) and government developmental testing are now estimated for FY21.

FY20 AIR FORCE PROGRAMS

- The coronavirus (COVID-19) pandemic affected test operations by inhibiting travel of Air Force and contractor flight crew and support personnel. COVID-19 also contributed to delays in logistics support from Leonardo in Italy, but the program's overall critical path was not significantly affected by COVID-19 restrictions.
 - In an attempt to recover from the STC delays, the program is revising its test strategy to rely more heavily on government-observed, contractor-performed flight test. Dedicated government developmental flight testing will be curtailed and refocused on remaining air vehicle specification verification in direct support of the MFR, and on some additional military utility evaluation events.
 - The 47th Cyberspace Test Squadron conducted two cooperative vulnerability identification events in April and May 2020 on a partially modified AW-139 that was not production representative. The third cybersecurity test event on a production-representative MH-139A has been delayed.
 - The Air Force Operational Test and Evaluation Center (AFOTEC) published a series of periodic reports based on their observations and participation in the test program.
 - In July 2020, following completion of contractor qualification testing of the cabin and cockpit armor solution, the Air Force 704th Test Group completed the first phase of live fire evaluation of the MH-139A armor against expected small arms threats in accordance with the DOT&E-approved test plans.
 - The Air Force is currently developing test plans to evaluate the damage effects of expected small arms threats against the main gearbox, main rotor blade, and the tail rotor blade.
 - The Air Force is developing plans to perform electromagnetic pulse hardness testing in late FY21.
- airworthiness and certification may not accurately represent the capability of the aircraft to conduct military flight profiles at these demanding conditions.
- Contractor testing of emergency crew egress from the MH-139A-configured cabin may not reveal obstacles encountered by a fully equipped security force in the operational environment.
- Reliance on contractor data during developmental testing risks increasing the scope of the IOT&E unless conducted during military utility events.
 - AFOTEC periodic reports highlighted several areas of risk in the system design:
 - Expansion of the flight performance envelope is likely to stress engine components and increase maintenance requirements.
 - The MH-139A cabin configuration is different than the legacy UH-1N and the layout presents challenges to the employment of a security force.
 - The commercial landing gear design may not support tactical landings on unprepared surfaces in austere locations.
 - The commercial aircraft's flight manual includes restrictions on takeoffs in crosswinds or near obstacles that hinder military operations.
 - Contractor testing of the gun mount has revealed multiple design deficiencies that must be corrected to ensure safe operation of the gun weapon system.
 - For most expected engagement conditions, the cabin and cockpit armor did not provide the required protection against the specification threat. The armor also did not provide adequate protection against another, operationally representative small arms threat at all relevant ranges.
 - The Air Force has a requirement for the MH-139A to include infrared signature suppression that is currently not part of the aircraft design.

Assessment

- The revised test strategy increases risk to the program. The current STC schedule delays the MFR causing a subsequent delay to the majority of government weapons, defensive systems, and envelope expansion flight test events. This delay will limit the test data available to inform the scheduled Milestone C decision.
- Use of civil certifications instead of government developmental testing may not adequately inform some areas of military utility. For example:
 - Aircraft performance and handling qualities at high altitude, hot temperatures, and heavy weight for

Recommendation

1. The MH-139A program should develop an updated event-driven schedule that supports adequate test and evaluation program in time to inform acquisition and operational decisions.