



Source: U.S. Air Force. | GAO-22-105230

MH-139A Gray Wolf Helicopter (MH-139A)

The MH-139A program will replace the Air Force’s fleet of 63 UH-1N utility helicopters. The MH-139A helicopter’s missions will include securing intercontinental ballistic missile sites and convoys and transporting senior government officials in the National Capital Region. The MH-139A program is acquiring a militarized version of a commercial helicopter to be integrated with previously developed systems. In addition to the helicopters, the program plans to acquire an integration laboratory, a training system, and support and test equipment.



Program Essentials

Milestone decision authority: Air Force
Program office: Wright-Patterson Air Force Base, OH
Prime contractor: Boeing
Contract type: FFP (development)

Acquisition Cycle Time

(in months)



Software Development

(as of January 2022)

Approach: Agile and Waterfall

Average time of software deliveries (months)



Software percentage of total program cost



Software type

99.6 percent Off-the-shelf
 0.4 percent Modified off-the-shelf
 0 percent Custom software

The program office reported that, because software is part of the overall firm-fixed-price contract, it does not have insight on the software costs incurred by the contractor.

Program Performance (fiscal year 2022 dollars in millions)

	First full estimate (9/2018)	Latest (7/2020)	Percentage change
Development	\$608.53	\$636.74	+4.6%
Procurement	\$2,588.97	\$2,607.14	+0.7%
Unit cost	\$42.10	\$41.60	-1.2%
Total quantities	84	80	-4.7%

Total quantities comprise six development quantities and 74 procurement quantities. Current cost and quantity data were not available because out-year funding estimates were not updated during the fiscal year 2022 budget cycle. The program reduced the total quantity to 80 after a mission requirement was removed. Cost figures have yet to be updated to account for this change.

Attainment of Product Knowledge (as of January 2022)

	Status at Development Start	Current Status
Resources and requirements match		
Demonstrate all critical technologies are very close to final form, fit, and function within a relevant environment	NA	NA
Demonstrate all critical technologies in form, fit, and function within a realistic environment	NA	NA
Complete a system-level preliminary design review	NA	NA
Product design is stable		
Release at least 90 percent of design drawings	○	●
Test a system-level integrated prototype	NA	NA
Manufacturing processes are mature		
Demonstrate Manufacturing Readiness Level of at least 9, or critical processes are in statistical control	NA	NA
Demonstrate critical processes on a pilot production line	NA	NA
Test a production-representative prototype in its intended environment	NA	NA

- Knowledge attained ... Information not available
- Knowledge not attained NA Not applicable

We did not assess MH-139A critical technologies because the program office reported it does not have any. We also did not assess preliminary design review or some design stability knowledge metrics because the program office reported these were not applicable. Further, we did not assess manufacturing maturity because the system has yet to reach production; however, the program stated that it tested a production-representative prototype in the system’s intended environment.

MH-139A Program

Technology Maturity and Design Stability

The MH-139A continues to undergo certification testing and, as a result, delayed program milestones. Program officials stated that the program office declared an acquisition program baseline schedule breach in April 2021, but as of January 2022, had yet to determine revised schedule dates.

MH-139A does not have any critical technologies, according to the program office. Over the past 2 years, program officials reported a significant increase in the total number of expected design drawings—from 507 to 7,808—including an increase of 3,689 drawings in 2021. Program officials said that Boeing previously provided the program an inaccurate number of drawings, overstating the stability of the design.

Program officials also stated that the aircraft's design configuration became more stable during 2021. They estimated almost all drawings were released to manufacturing as of September 2021, an indication of design stability.

Program officials stated that Boeing underestimated the scale of design work, impeding the program's ability to stabilize the design and delaying the production decision, which we previously reported was expected in September 2021. Last year, program officials stated that the aircraft design would become more stable once the aircraft obtained certification for demonstrated compliance with Federal Aviation Administration (FAA) requirements. However, according to program officials, the certification has yet to occur because Boeing experienced challenges integrating components that are new to the existing airframe. For example, some of the aircraft's new parts need to be redesigned as a result of certification testing.

Program officials told us they now plan to complete the FAA certification process by February 2022 and begin production in January 2023, a delay of 16 months from last year. This schedule change will also delay the full-rate production decision and initial operational capability. Program officials stated that they continue to work with Boeing to address these significant schedule delays, but Boeing has not submitted some contractually required data on time. Consequently, the program reported withholding 10 percent of its progress payments.

Additionally, in October 2021, Air Force officials told us that they had yet to determine the aircraft's final weight, despite aiming to do so by December 2019. Program officials said they worked closely with Boeing to identify weight risks, and that current estimates project the maximum gross weight will not affect the aircraft's required performance capabilities. Nonetheless, until the program is certain that the aircraft's final weight will not impede range and payload requirements, design rework may be needed to meet those requirements.

Production Readiness

Despite the production decision delay, as of January 2022, the program produced four aircraft and two more were in production. However, given the design instability, there are risks that later design changes could result in significant rework of aircraft already in production and retrofit of aircraft already delivered.

Software and Cybersecurity

The program did not report any significant changes to its software development since last year's assessment. The program conducted two cybersecurity assessments prior to January 2021, and plans to conduct additional testing on production aircraft, including an upcoming cybersecurity assessment in July 2022. Program office officials said that the program office conducts recurring working groups with the test community to coordinate on potential cybersecurity issues.

Other Program Issues

The program identified diminishing material sources and obsolescence as potential industrial base risks. The program office does not plan to complete a defense industrial base assessment and stated it was working with Boeing to mitigate these risks. Program officials noted that the MH-139A is a commercial-derivative air vehicle and existing manufacturing and support structures are in place to support the MH-139A.

Program Office Comments

We provided a draft of this assessment to the program office for review and comment. The program office provided technical comments, which we incorporated where appropriate. The program office stated that the MH-139A Grey Wolf is a commercial-derivative aircraft that leverages the parent design's engineering software and hardware foundation to provide military capabilities and training devices. The program noted that Boeing faced challenges achieving schedule benchmarks in civil airworthiness certification with the FAA. It added that to help mitigate delays, the program office revised its test strategy using the four available test aircraft to supplement contractor flight testing, with focused Air Force testing planned to follow. The program stated it continues to closely coordinate with the FAA, Boeing, the Air Force Global Strike Command, and the Air Force test community to develop plans to support a successful low-rate production decision. Further, the program reported that manufacturing readiness assessments were completed and the Air Force determined that manufacturing was sufficiently mature to enter low-rate initial production.