SYM-AM-22-061

Excerpt from the Proceedings of the Nineteenth Annual Acquisition Research Symposium

Acquisition Research: Creating Synergy for Informed Change

May 11–12, 2022

Published: May 2, 2022

Prepared for the Naval Postgraduate School, Monterey, CA 93943.

Acquisition Research Program
Department of Defense Management
Naval Postgraduate School

The research presented in this report was supported by the Acquisition Research Program at the Naval Postgraduate School.

To request defense acquisition research, to become a research sponsor, or to print additional copies of reports, please contact any of the staff listed on the Acquisition Research Program website (www.acquisitionresearch.net).

Acquisition Research Program
Department of Defense Management
Naval Postgraduate School

How is the DoD Addressing Challenges with Its Mobile User Objective System Program?

Erin R. Cohen—is a Senior Analyst with the U.S. Government Accountability Office. For the past 14 years, her work focused on military space acquisition issues and assessments of Department of Defense programs such as National Security Space Launch, Next Generation OPIR, and the Mobile User Objective System, among other things. Cohen has also done work on NASA's Lunar programs. Cohen lives with her family in Denver, CO. [cohene@gao.gov]

Additional team members on original report: Jon Ludwigson (Director), Rich Horiuchi (Assistant Director), Desiree Cunningham, Margaret Fischer, and Lucas Smith.

Abstract

The Department of Defense (DoD) is not using the full capabilities of its latest ultra high frequency (narrowband) military satellite communications system, the Mobile User Objective System (MUOS). The full MUOS constellation has been on orbit for over 4 years, but the DoD has not been able to fully use the system's advanced capabilities—such as its 10-fold increase in communications capacity—primarily due to delays in fielding compatible radio terminals to users. The DoD faces other challenges to its narrowband communication capabilities, such as near-term reliance on oversubscribed communication systems that preceded MUOS. Additionally, on-orbit MUOS satellites have limited design lives, and while the DoD plans to buy and launch additional satellites to sustain the constellation, those additional satellites won't have legacy capability of the older system. See GAO-21-105283 for more information.

Why We Did This Study

The Department of Defense (DoD) has invested $7.4 billion to develop, build, and begin delivering the Mobile User Objective System (MUOS). However, longstanding gaps between the fielding of the satellite system and compatible user terminals have limited the DoD's ability to fully use the system.

The Senate Armed Services Committee report to the bill for the National Defense Authorization Act for Fiscal Year 2020 contained a provision for the Government Accountability Office (GAO) to review the DoD's use of MUOS capabilities and any plans for a MUOS follow-on capability. In this report, the GAO (1) provides information on the extent to which the DoD is using MUOS advanced communications capabilities, (2) assesses the DoD's challenges and steps taken in transitioning to these capabilities, and (3) assesses efforts the DoD has underway to meet future narrowband satellite communications needs.

The GAO reviewed DoD planning documents, system assessments, and test reports. The GAO also analyzed the services' terminal fielding and network transition plans. The GAO interviewed oversight and acquisition officials across the DoD.

What We Found

We found that the DoD was not using the full capabilities of its latest ultra high frequency (narrowband) military satellite communications system, MUOS. MUOS provides secure communications less vulnerable to weather conditions or other potential impediments. While the full constellation of MUOS satellites had been on orbit for over 4 years, we found that the DoD had not been able to fully use the system's advanced capabilities—such as its 10-fold increase in communications capacity. We found that this was due to delays in fielding MUOS-compatible terminals and transitioning communication networks. At the time of our review, the DoD had begun using the terminals in several military operations or exercises. Additionally, most of the services had begun using their terminals in testing, training, and evaluations over the past few

years. The DoD was funding and developing plans to accelerate procurement and delivery of these terminals.

The DoD faced other challenges to its narrowband communications capabilities:

- In the near term, users continued to rely on the communications system that preceded MUOS, which was oversubscribed and will remain so while the DoD works to field terminals and transition to MUOS. Delays in MUOS development and fielding compatible terminals led to continued reliance on legacy UHF capabilities, the demand for which has exceeded supply. For example, a 2019 Navy analysis found that users across the DoD consistently used 100% of the available UHF SATCOM channels. The true extent of the oversubscription is unclear. According to U.S. Space Command officials, some users decide not to request legacy UHF services, anticipating that the requests will be denied. At the time of our review, the DoD had not explored and adopted narrowband communication options, which, if implemented, could help to meet unmet near-term communication needs.
- In the longer term, the five MUOS satellites that are on orbit have limited design lives (as do all satellites). The DoD planned to buy and launch additional satellites to sustain the constellation's availability, but without the legacy capability of the older system. In 2020, the Deputy Secretary of Defense directed the Navy to acquire additional satellites to extend the service life of the current MUOS system, MUOS 6 and 7, to be launched in the mid- to late-2020s. According to officials, the DoD planned for these satellites to have the same advanced MUOS capabilities as the original MUOS satellites, but they will not include the legacy UHF capabilities because of an assumption that the services would be able to accelerate the fielding of MUOS-compatible terminals and transition most networks by the mid-2020s. However, according to Navy officials, the mid-2020s launch date for MUOS 6 was based on an expedited time frame that is no longer feasible. Additionally, officials told us that funding delays contributed to starting development efforts one year later than planned. As a result, MUOS program office officials expect that MUOS 6 and 7 development efforts will likely not start until the early 2020s, with the first satellite launch not occurring before the late 2020s.

At the time of our review, the DoD had not determined its future narrowband satellite communication needs after MUOS. Over the past 7 years, DoD reports recommended that the Navy identify and assess potential solutions for meeting users' future narrowband SATCOM needs. The DoD has not updated its narrowband requirements since 2010 and has no plans to do so, although the uses, technology, and threats to communications have changed. For example, user needs had evolved as a result of (1) space becoming a contested operational environment for future satellite-based communications systems, (2) increased communication needs of users, and (3) advances in communication and related technologies. Our review found that reexamining its narrowband communications needs would enhance the DoD's ability to field a timely replacement for MUOS and ensure warfighters have needed communications tools in the future.

What the GAO Recommended

The GAO recommended the DoD (1) explore and implement an option for narrowband satellite communications capabilities to meet near-term needs and (2) reexamine its future narrowband satellite needs. The DoD concurred with our recommendations.

Acquisition Research Program
Naval Postgraduate School
555 Dyer Road, Ingersoll Hall
Monterey, CA 93943

www.acquisitionresearch.net