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Defense > 3. Unmanned Aircraft Systems

Ineffective acquisition practices and collaboration efforts in the Department of Defense unmanned aircraft systems portfolio creates overlap and the potential for duplication among a number of current programs and systems.

Why This Area Is Important

The Department of Defense (DOD) estimates that the cost of current unmanned aircraft systems (UAS) acquisition programs and related systems will exceed $37.5 billion in fiscal years 2012 through 2016.[1] These programs and systems can be found across DOD and the military services (Air Force, Army, Navy, and Marine Corps). The continued success of UAS on the battlefield has led to greatly increased demand from warfighters and the development of many new systems. Further, in announcing the department's new budget priorities, the Secretary of Defense highlighted various current and planned unmanned systems that are considered to be high-priority in terms of meeting the requirements of the new strategic guidance.

In 2009, GAO's work highlighted the need to consider commonality in UAS—using the same or interchangeable subsystems and components in more than one subsystem to improve interoperability of systems—and indicated that DOD lacked an analytical approach to prioritize capability needs which would reduce the likelihood of redundancies in UAS capabilities. As GAO reported in June 2011, although the Joint Requirements Oversight Council is directed to ensure that trade-offs among cost, schedule, and performance objectives are considered as part of its requirements review process, it currently does not prioritize requirements, consider redundancies across proposed programs, or prioritize and analyze capability gaps in a consistent manner. Congress has enacted legislation requiring DOD to establish a policy and acquisition strategy for more common ground stations and payloads for manned and unmanned aircraft systems.[2]

The elements of DOD's planned UAS portfolio include unmanned aircraft, payloads, and ground control stations. Unmanned aircraft are fixed or rotary winged aircraft capable of flight without an onboard crew. Payloads are subsystems and equipment carried on a UAS configured to accomplish specific missions, including intelligence, surveillance, and reconnaissance and attack. Ground control stations handle multiple mission aspects such as system command and control, mission planning, payload control, and communications.

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[1]The $37.5 billion amount includes funding for the development, procurement, sustainment, military construction and personnel, and war funding to support UAS activities in then year dollars identified in the President's 2012 budget submission.

[2]Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. No. 110-417, §144 (2008).

What GAO Found

Military service-driven requirements—rather than an effective departmentwide strategy—have led to overlap in DOD's UAS capabilities, resulting in many programs and systems being pursued that have similar flight characteristics and mission requirements. DOD currently has 15 unmanned aircraft programs which it categorizes into five groups according to weight, altitude, and speed. Groups 4 and 5 contain the largest and most expensive aircraft, with weights exceeding 1,320 pounds. Group 5 aircraft fly higher—above 18,000 feet—than Group 4 aircraft. DOD has spent almost $19 billion through fiscal year 2011 to develop and procure three aircraft in Group 5 and five aircraft in Group 4, where GAO found potential overlap, and expects to spend an additional $32.4 billion to complete these programs.

Illustrative of the overlap, in Group 5, the Navy plans to spend more than $3 billion to develop its own variant of the Air Force Global Hawk—the Broad Area Maritime Surveillance UAS—rather than using the already fielded Global Hawk. According to the Navy, its unique requirements necessitate modifications to the Global Hawk airframe, payload interfaces, and ground control station. However, the Navy program office was not able to provide quantitative analysis to justify the variant. According to program officials, no analysis was conducted to determine the cost-effectiveness of developing a new aircraft to meet the Navy's requirements versus buying more Global Hawks.

If the preference for service-unique solutions persists in the absence of a departmentwide strategy, so will the potential for overlap in the future. DOD plans to significantly expand the UAS portfolio through 2040, including five new systems in the planning stages that are expected to become formal programs in the near future.

In addition to unmanned aircraft, DOD expects to spend about $9 billion to buy 42 UAS payloads through fiscal year

2016. Each payload provides a sensor using one of three different technologies: electro-optical/infra-red, radar, and signals intelligence. For Group 4 and 5 aircraft, GAO identified overlap among numerous sensors being developed within each of the three technologies (see table below).

Overlapping Development of Sensors for UAS Payloads in Group 4 and 5 Aircraft

Sensor type	Number of programs
Electro-optical/infra-red	Four Air Force programs
	Four Army programs
	One Navy program
	Five multiservice programs
Radar	Three Air Force programs
	Two Army programs
	One Navy program
	One multiservice program
Signals intelligence	Four Air Force programs
	Two Navy programs
	Two Army programs

Source: GAO analysis of DOD data.

While the fact that some multiservice payloads are being developed shows the potential for collaboration, the service-centric requirements process still creates the potential for overlap. For example, the Army and Air Force are developing two separate signals intelligence sensors (the TSP and ASIP 2-C, respectively) that have similar capabilities to track ground communication and activity. According to a DOD-sponsored study in March 2010, the department could have saved almost $1.2 billion had the Air Force acquired the same sensor as the Army. However, since such an approach was not considered earlier in the program, DOD concluded there was not a business case for combining the programs. Instead, the study noted, the ideal time for such a decision would have been when requirements were being determined. More recently, the Navy has begun development of its own signals intelligence payload (the MCS-21) for the Broad Area Maritime Surveillance aircraft, even though the sensor's capabilities are similar to those of the Air Force and Army payloads.

Through fiscal year 2016, DOD plans to spend about $3 billion to acquire 13 ground control stations and GAO identified overlap and potential duplication among 10 of these systems. Because aircraft, payloads and control stations are usually developed together, a unique ground control station therefore exists for almost every UAS that DOD has acquired. According to a cognizant DOD official, the associated software is about 90 percent duplicative because similar software is developed for each ground control station. Even though the functionality of the software is similar, a

considerable amount of additional time and money is invested in capabilities that have already been paid for and can also make it difficult and costly to modify or upgrade.

DOD has acknowledged that an open architecture framework could provide opportunities for increased competition and collaboration to satisfy requirements through common software solutions, among other areas. DOD has created a UAS control segment working group, which is chartered to increase interoperability and enable software re-use and open systems. This could allow for greater efficiency, less redundancy, and lower costs, while potentially reducing levels of contractor proprietary data that cannot be shared across UAS programs. However, existing ground control stations already have their own architecture and migration to a new service-oriented architecture will not happen until at least 2015, almost 6 years after it began.[1]

DOD has acknowledged that it has bought many UAS systems inefficiently and has begun to take steps to improve outcomes as it expands these capabilities over the next several years. DOD continues to face challenges in its ability to improve efficiency and reduce the potential for overlap and duplication as it buys UAS capabilities:

- GAO recommended in November 2008, among other things, that DOD designate a single entity to integrate all crosscutting efforts related to improving the management and operation of UAS, including to ensure that all UAS systems were designed to meet joint service requirements and interoperability standards. DOD did not agree, stating that rather than an executive agent, the combination of the UAS Task Force (created in 2007 to encourage initiatives for collaboration among the military services) and other initiatives would serve to address UAS challenges. Currently, the Task Force has no decision-making authority and cannot direct the military services' efforts to acquire UAS capabilities. As such, while the military services participate at all levels of the Task Force, they do not always fully support related initiatives and, therefore, do not achieve the potential benefits from collaboration.
- GAO recommended in July 2009 that DOD not begin new programs until evaluating systems from a multiservice perspective and take an open systems approach to product development. While DOD concurred with this recommendation, it believes current practices do not encourage duplicative systems development. However, among future UAS aircraft, the Army and Navy are planning to spend approximately $1.6 billion to acquire separate systems that are likely to have similar capabilities to meet upcoming cargo and surveillance requirements. DOD officials state that current requirements do not preclude a joint program to meet these needs, but the Army and Navy have not yet determined whether such an approach will be used.
- Despite DOD direction, although the Air Force and the Army used the same contractor to procure the Predator and Gray Eagle UAS, the programs achieved only limited success with efforts to combine programs and missed an opportunity to potentially save hundreds of millions of dollars. The Air Force now plans to procure Reaper UAS rather than the Predator.

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[1]In 2009, the Office of the Secretary of Defense directed the military services to develop a common control station service-oriented architecture for implementation into the military services' control stations to help acquire, integrate, and extend the capabilities of current control stations across the UAS portfolio. The Air Force has decided to implement a "complementary" architecture.

Actions Needed

To reduce the likelihood of overlap and potential duplication in its UAS portfolio, GAO has made several prior recommendations to DOD which have not been fully implemented. While DOD generally agreed with the intent of those recommendations, the department has not always agreed with the proposed method of implementation. The overlap in current UAS programs, as well as the continued potential in future programs, shows that DOD must still do more to implement GAO's prior recommendations. GAO believes the potential for savings is significant and with DOD's renewed commitment to UAS for meeting new strategic requirements, all the more imperative. Specifically, DOD should

- re-evaluate whether a single entity would be better positioned to integrate all crosscutting efforts to improve the management and operation of UAS;
- consider an objective, independent examination of current UAS portfolio requirements and the methods for acquiring future unmanned aircraft, including strategies for making these systems more common, to ensure the best return on every dollar it invests; and
- prior to initiating future unmanned aircraft programs, direct the military services to identify and document in their acquisition plans and strategies specific areas where commonality can be achieved, take an open systems approach to product development, conduct a quantitative analysis that examines the costs and benefits of various levels of commonality, and establish a collaborative approach and management framework to periodically assess and effectively manage commonality.

How GAO Conducted Its Work

The information contained in this analysis is based on findings from products listed in the related GAO products section and additional work GAO conducted. GAO comprehensively identified, to the extent possible, using a data collection instrument, DOD's UAS portfolio to analyze how DOD and the military services acquired this portfolio. GAO assessed the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics and military service UAS roadmaps, requirements, and concepts of operation. GAO conducted interviews with officials from the Joint Chiefs of Staff, the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, military service laboratories and program offices, as well as UAS contractors. Using these data, GAO evaluated to what extent collaboration and coordination efforts by DOD and the military services resulted in—or reduced the potential for—duplication, fragmentation, and overlap.

See pages 337-338 of the PDF version of this report (appendix III) for a list of the programs GAO identified that may have similar or overlapping objectives, provide similar services or be fragmented across government missions. Overlap and fragmentation may not necessarily lead to actual duplication, and some degree of overlap and duplication may be justified.

Agency Comments & GAO Contact

GAO provided a draft of this report section to DOD. DOD provided clarifications on individual program decisions and other technical comments which were incorporated as appropriate. As part of its routine audit work, GAO will track agency actions to address these recommendations and report to Congress.

For additional information about this area, contact Michael J. Sullivan at (202) 512-4841 or sullivanm@gao.gov.

Related Products

Unmanned Vehicles

Assessment of DOD's Unmanned Aerial Vehicle Master Plan
NSIAD-89-41BR, Dec 19, 1988

Unmanned Aircraft Systems

New DOD Programs Can Learn from Past Efforts to Craft Better and Less Risky Acquisition Strategies
GAO-06-447, Mar 15, 2006

Unmanned Aircraft Systems

DOD Needs to More Effectively Promote Interoperability and Improve Performance Assessments
GAO-06-49, Dec 13, 2005

Unmanned Aircraft Systems

Advance Coordination and Increased Visibility Needed to Optimize Capabilities
GAO-07-836, Jul 11, 2007

Unmanned Aircraft Systems

Additional Actions Needed to Improve Management and Integration of DOD Efforts to Support Warfighter Needs
GAO-09-175, Nov 14, 2008

Unmanned Aerial Vehicles

Changes in Global Hawk's Acquisition Strategy Are Needed to Reduce Program Risks
GAO-05-6, Dec 6, 2004

Intelligence, Surveillance, and Reconnaissance

Actions Are Needed to Increase Integration and Efficiencies of DOD's ISR Enterprise
GAO-11-465, Jun 3, 2011

Force Structure

Improved Strategic Planning Can Enhance DOD's Unmanned Aerial Vehicles Efforts
GAO-04-342, Mar 18, 2004

DOD Weapon Systems

Missed Trade-off Opportunities During Requirements Reviews
GAO-11-502, Jun 16, 2011

Defense Acquisitions

Opportunities Exist to Achieve Greater Commonality and Efficiencies among Unmanned Aircraft Systems
GAO-09-520, Jul 30, 2009

Defense Acquisitions

Matching Resources with Requirements Is Key to the Unmanned Combat Air Vehicle Program's Success
GAO-03-598, Jun 30, 2003

Defense Acquisitions

Better Acquisition Strategy Needed for Successful Development of the Army's Warrior Unmanned Aircraft System
GAO-06-593, May 19, 2006

Ballistic Missile Defense

More Common Systems and Components Could Result in Cost Savings
NSIAD-99-101, May 21, 1999