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DEFENSE ADDITIVE MANUFACTURING

DOD Needs to Systematically Track Department-wide 3D Printing Efforts

GAO Highlights

Highlights of GAO-16-56, a report to congressional committees

Why GAO Did This Study

Additive manufacturing—building products layer-by-layer in a process often referred to as three-dimensional (3D) printing—has the potential to improve aspects of DOD's mission and operations. DOD and other organizations, such as America Makes, are determining how to address challenges to adopt this technology throughout the department.

Senate Report 113-44 directed DOD to submit a briefing or report on additive manufacturing to the Senate Armed Services Committee that describes three elements. Senate Report 113-176 included a provision that GAO review DOD's use of additive manufacturing. This report addresses the extent to which (1) DOD's briefing to the Committee addresses the directed elements; (2) DOD has taken steps to implement additive manufacturing to improve performance, improve combat capability, and achieve cost savings; and (3) DOD uses mechanisms to coordinate and systematically track additive manufacturing efforts across the department. GAO reviewed and analyzed relevant DOD documents and interviewed DOD and academia officials.

What GAO Recommends

GAO recommends that DOD designate an Office of the Secretary of Defense lead to be responsible for developing and implementing an approach for systematically tracking department-wide activities and resources, and results of these activities; and for disseminating these results to facilitate adoption of the technology across the department. DOD concurred with the recommendation.

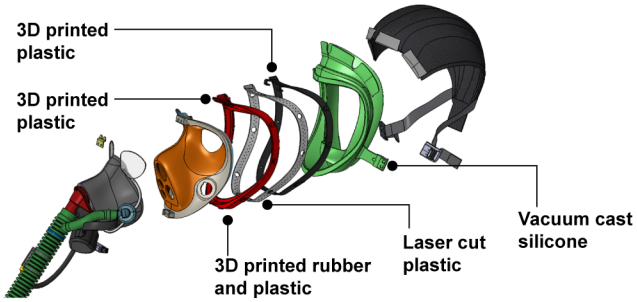
View GAO-16-56. For more information, contact Zina Merritt at (202) 512-5257 or merrittz@gao.gov.

What GAO Found

GAO determined that the Department of Defense's (DOD) May 2014 additive manufacturing briefing for the Senate Armed Services Committee addressed the three directed elements—namely, potential benefits and constraints; potential contributions to DOD mission; and transition of the technologies of the National Additive Manufacturing Innovation Institute ("America Makes," a public-private partnership established to accelerate additive manufacturing) for DOD use.

DOD has taken steps to implement additive manufacturing to improve performance and combat capability, and to achieve cost savings. GAO obtained information on multiple efforts being conducted across DOD components. DOD uses additive manufacturing for design and prototyping and for some production, such as parts for medical applications; and it is conducting research to determine how to use the technology for new applications. For example, according to a senior Air Force official, the Air Force is researching potential performance improvements that may be achieved by embedding devices such as antennas within helmets through additive manufacturing that could enable improved communications; and the Army used additive manufacturing to prototype aspects of a Joint Service Aircrew Mask to test a design change, and reported thousands of dollars thereby saved in design development (see figure).

Aspects of Army's Joint Service Aircrew Mask Prototyped Using Additive Manufacturing



Source: Department of Defense (DOD). | GAO-16-56

DOD uses various mechanisms to coordinate on additive manufacturing efforts, but it does not systematically track components' efforts department-wide. DOD components share information regarding additive manufacturing via mechanisms such as working groups and conferences that, according to DOD officials, provide opportunities to discuss challenges experienced in implementing additive manufacturing—for example, qualifying materials and certifying parts. However, DOD does not systematically track additive manufacturing efforts, to include (1) all activities performed and resources expended by DOD; and (2) results of these activities, including actual and potential performance and combat capability improvements, cost savings, and lessons learned. DOD has not designated a lead or focal point at a senior level to systematically track and disseminate the results of these efforts, including activities and lessons learned, department-wide. Without designating a lead to track information on additive manufacturing efforts, which is consistent with federal internal control standards, DOD officials may not obtain the information they need to leverage ongoing efforts.