

Why GAO Did This Study

DOD invests tens of billions of dollars each year in major defense acquisition programs, designing and developing technologically advanced weapon systems that warfighters expect will meet specific performance requirements, including reliability requirements. Systems that are not reliable make it more difficult for warfighters to perform their missions.

GAO was asked to examine DOD weapon system reliability. This report addresses (1) how selected companies in the commercial sector address reliability, (2) how selected DOD acquisition programs addressed reliability, and (3) the extent to which DOD leadership has highlighted key reliability practices.

GAO collected information on leading commercial practices at the 2019 Reliability and Maintainability Symposium and from four commercial companies known for delivering reliable products. GAO also assessed how seven DOD acquisition programs—both older and newer, and representing all the military services—addressed reliability; reviewed key documents and interviewed knowledgeable officials; and reviewed reliability-related guidance and policy from senior DOD leaders.

What GAO Recommends

GAO recommends the Secretaries of the Air Force, Army, and Navy highlight the importance of three key reliability practices: leveraging reliability engineers, establishing realistic reliability requirements, and employing reliability engineering activities to improve a system's design throughout development. DOD agreed with GAO's recommendations.

View [GAO-20-151](#). For more information, contact Michele Mackin at (202) 512-4841 or mackinm@gao.gov.

DEFENSE ACQUISITIONS

Senior Leaders Should Emphasize Key Practices to Improve Weapon System Reliability

What GAO Found

The commercial companies GAO reviewed proactively address reliability. They strive to identify reliability issues at the component level early in the development process to avoid expensive rework after producing an entire system. GAO found these companies focus on the following key practices:

1. Leveraging reliability engineers early and often
2. Establishing realistic reliability requirements
3. Emphasizing reliability with their suppliers
4. Employing reliability engineering activities to improve a system's design throughout development

GAO found that the seven Department of Defense (DOD) acquisition programs it reviewed did not consistently adhere to these key practices (see figure). These programs often prioritized schedule and cost over incorporating the key reliability practices, and these systems generally were not as reliable as promised.

Key Characteristics of Selected Acquisition Programs' Approach to Reliability

Program name and development start	Did not leverage government reliability engineers early	Initially pursued unrealistic reliability requirements	Did not effectively emphasize reliability with suppliers (contractors)	Deferred reliability engineering activities
V-22 Osprey, 1986		X	X	X
F-22 Raptor, 1991	X	X		X
Expeditionary Fighting Vehicle, 2000	X	X	X	X
F-35 Lightning II, 2001		X	X	X
Joint Light Tactical Vehicle, 2012				
Armored Multi-Purpose Vehicle, 2014			X	X
VH-92A Presidential Helicopter Replacement Program, 2014				

Source: GAO analysis of Department of Defense documentation and testimonial evidence. | GAO-20-151

In 2019, DOD highlighted in a policy memorandum the importance of emphasizing reliability with contractors. However, the other three key practices have not been similarly highlighted. DOD has taken steps to accelerate weapon system development, and decision-making authority has been delegated to the military services. In an environment emphasizing speed, without senior leadership focus on a broader range of key reliability practices, DOD runs the risk of delivering less reliable systems than promised to the warfighter and spending more than anticipated on rework and maintenance of major weapon systems.