

## Why GAO Did This Study

NASA historically has experienced cost growth and schedule slippage in its portfolio of major projects and has taken actions to improve in this area, including adopting the use of EVM. EVM is a tool developed to help project managers monitor risks. GAO was asked to examine (1) the extent to which NASA is using EVM to manage its major space flight acquisitions, (2) the challenges that NASA has faced in implementing an effective EVM system, and (3) NASA's efforts to improve its use of EVM. To address these questions, GAO obtained contractor and project EVM data and used established formulas and tools to analyze the data and assess NASA's implementation of EVM on 10 major spaceflight projects; interviewed relevant NASA headquarters, center and mission directorate officials on their views on EVM; and reviewed prior reports on EVM and organizational transformations. GAO compared NASA policies and guidance on EVM to best practices contained in GAO's cost estimating best practices guide.

## What GAO Recommends

GAO recommends that NASA establish a time frame for requiring new spaceflight projects to implement its new EVM system; conduct an EVM skills gap assessment; develop a change management plan for EVM; and strengthen its EVM requirements by requiring projects to implement formal EVM surveillance. NASA concurred with two recommendations and partially concurred with two others citing resource constraints. Despite NASA's plans to address some issues GAO identified, not addressing all key issues lessens the usefulness of EVM at NASA.

View [GAO-13-22](#). For more information, contact Cristina Chaplain at (202) 512-4841 or [chaplainc@gao.gov](mailto:chaplainc@gao.gov).

## NASA

# Earned Value Management Implementation across Major Spaceflight Projects Is Uneven

## What GAO Found

The National Aeronautics and Space Administration's (NASA) 10 major spaceflight projects discussed in this report have not yet fully implemented earned value management (EVM). As a result, NASA is not taking full advantage of opportunities to use an important tool that could help reduce acquisition risk. GAO assessed the 10 projects against three fundamental EVM practices that, according to GAO's best practices cost guide, are necessary for maintaining a reliable EVM system. GAO found shortfalls in two of three fundamental practices. Specifically, we found that

- More than half of the projects did not use an EVM system that was fully certified as compliant with the industry EVM standard.
- Only 4 of the 10 projects established formal surveillance reviews, which ensure that key data produced by the system was reliable. The remaining 6 projects provided evidence of monthly EVM data reviews; however, the rigor of both the formal and informal surveillance reviews is questionable given the numerous data anomalies GAO found.

GAO also found that 3 projects had reliable EVM data while 7 had only partially reliable data. For the EVM data to be considered reliable per best practices it must be complete and accurate with all data anomalies explained.

NASA EVM focal points, headquarters officials, project representatives, and program executives cited cultural and other challenges as impediments to the effective use of EVM at the agency. Traditionally, NASA's culture has focused on managing science and engineering challenges and not on monitoring cost and schedule data, like an effective EVM system produces. As a result, several representatives said this information traditionally has not been valued across the agency. This sentiment was also echoed in a NASA study of EVM implementation. Also cited as a challenge to the effective use of EVM was NASA's insufficient number of staff with the skills to analyze EVM data. Without a sufficient number of staff with such skills, NASA's ability to conduct a sound analysis of the EVM data is limited. However, NASA has not conducted an EVM skills gap analysis to determine the extent of its workforce needs.

NASA has undertaken several initiatives aimed at improving the agency's use of EVM. For example, NASA strengthened its spaceflight management policy to reflect the industry EVM standard and has developed the processes and tools for projects to meet these standards through its new EVM system. While these are positive steps, the revised policy contains only the minimum requirements for earned value management. For example, it lacks a requirement for rigorous surveillance of how projects are implementing EVM and also does not require use of the agency's newly developed EVM system to help meet the new requirements. NASA has attempted to address EVM shortcomings through policy changes over the years, but these efforts have failed to adequately address the cultural resistance to implementing EVM.