

GAO Highlights

Highlights of [GAO-15-483T](#), a testimony before the Subcommittee on Space, Committee on Science, Space, and Technology, House of Representatives

Why GAO Did This Study

JWST is one of the National Aeronautics and Space Administration's (NASA) most complex and expensive projects. At an anticipated cost of \$8.8 billion, JWST is intended to revolutionize understanding of star and planet formation, advance the search for the origins of the universe, and further the search for earth-like planets. Since entering development in 1999, JWST has experienced significant schedule delays and increases to project costs and was rebaselined in 2011. With significant integration and testing planned during the approximately 3.5 years until the launch date in October 2018, the JWST project will need to address many challenges before NASA can conduct the science the telescope is intended to produce. GAO has reviewed JWST for the last 3 years as part of an annual mandate and for the last 7 years as part of another annual mandate to review all of NASA's major projects. Prior to this, GAO also issued a report on JWST in 2006.

This testimony is based on GAO's third annual report on JWST ([GAO-15-100](#)), issued in December 2014, with limited updated information provided where applicable. That report assessed, among other issues, the extent to which (1) technical challenges were impacting the JWST project's ability to stay on schedule and budget, and (2) budget and cost estimates reflected current information about project risks. To conduct that work, GAO reviewed monthly JWST reports, interviewed NASA and contractor officials, reviewed relevant policies, and conducted independent analysis of NASA and contractor data.

View [GAO-15-483T](#). For more information, contact Cristina Chaplain at (202) 512-4841 or chaplainc@gao.gov.

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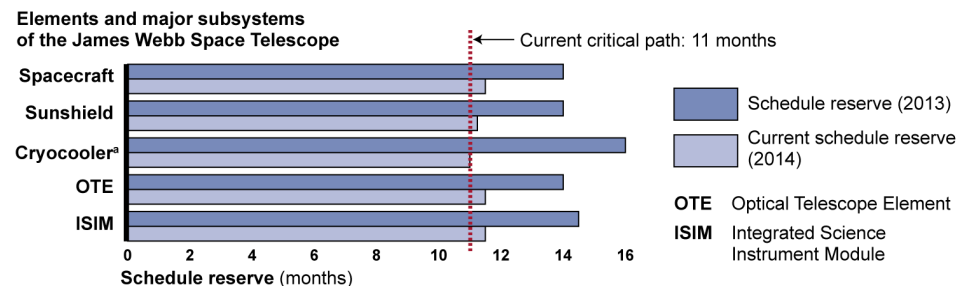
JAMES WEBB SPACE TELESCOPE

Project Facing Increased Schedule Risk with Significant Work Remaining

What GAO Found

James Webb Space Telescope (JWST) project officials report that the effort remains on track toward the schedule and budget established in 2011. However, the project is now in the early stages of its extensive integration and testing period. Maintaining as much schedule reserve as possible during this phase is critical to resolve challenges that will likely surface and negatively impact the schedule. JWST has begun integration and testing for only two of five elements and major subsystems. While the project has been able to reorganize work when necessary to mitigate schedule slips thus far, this flexibility will diminish as work during integration and testing tends to be more serial, as initiating work is often dependent on the successful and timely completion of the prior work.

Schedule Reserve Changes on the James Webb Space Telescope's Elements and Major Subsystems from 2013 to 2014



Source: GAO analysis of NASA data. | [GAO-15-483T](#)

^aThe cryocooler chills an infrared light detector on one of JWST's four scientific instruments.

In December 2014, GAO reported that delays had occurred on every element and major subsystem schedule, each was at risk of driving the overall project schedule, and the project's schedule reserve had decreased from 14 to 11 months. As a result, further delays on any element or major subsystem would increase the overall schedule risk for the project. At the time of the report, challenges with manufacturing of the cryocooler had delayed that effort and it was the driver of the overall project schedule. Since the December report, the project's overall schedule reserve decreased to 10 months as a result of several problems that were identified following a test of the Integrated Science Instrument Module (ISIM), which contains the telescope's scientific instruments. ISIM is now driving the overall project schedule. Furthermore, additional schedule impacts associated with challenges on several other elements and major subsystems are still being assessed.

At the time of the December 2014 report, the JWST project and prime contractor's cost risk analyses used to validate the JWST budget were outdated and did not account for many new risks identified since 2011. GAO best practices for cost estimating call for regularly updating cost risk analyses to validate that reserves are sufficient to account for new risks. GAO recommended, among other actions, that officials follow best practices while conducting a cost risk analysis on the prime contract and update the analysis as significant risks emerged. NASA partially concurred, noting that it has a range of tools in place to assess performance and would update the analysis as required by policy. Since then, officials completed the analysis and GAO is currently examining the results.