



Highlights of [GAO-04-201T](#),  
a testimony before the Subcommittee on  
Science, Technology, and Space,  
Committee on Commerce, Science, and  
Transportation, U.S. Senate

## Why GAO Did This Study

Since its inception, the International Space Station has experienced numerous problems that have resulted in significant cost growth and assembly schedule slippages. Following the Columbia accident and the subsequent grounding of the shuttle fleet in February 2003, concerns about the future of the space station escalated, as the fleet has been key to the station's assembly and operations.

In August 2003, the Columbia Accident Investigation Board drew a causal link between aggressive space station goals—supported by the National Aeronautics and Space Administration's (NASA) current culture—and the accident. Specifically, the Board reported that, in addition to technical failures, Columbia's safety was compromised in part by internal pressures to meet an ambitious launch schedule to achieve certain space station milestones.

This testimony discusses the implications of the shuttle fleet's grounding on the space station's schedule and cost, and on the program's partner funding and agreements—findings we reported on in September 2003. The testimony also proposes a framework for providing NASA and the Congress with a means to bring about and assess needed cultural changes across the agency.

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## NASA

# Shuttle Fleet's Safe Return to Flight Is Key to Space Station Progress

## What GAO Found

Since the grounding of the shuttle fleet last February, the space station has been in a survival mode. Due to the limited payload capacity of the Russian launch vehicles—which the program must now rely on to transport crew and supplies to and from the station—on-orbit assembly is at a standstill and on-board research has been limited. Moreover, certain safety concerns on board the station cannot be corrected until the shuttle fleet returns to flight. For example, NASA has had to delay plans to fly additional shielding to protect the on-orbit Russian Service Module from space debris—a risk that increases each year the shielding is not installed.

To date, NASA has not fully estimated the increased costs and future budget impact incurred due to the grounding of the space shuttle fleet. However, it projects that additional costs of maintaining the space station while the shuttle fleet is grounded will reach almost \$100 million for fiscal years 2003 and 2004. It has also identified a number of factors that will affect costs—including the need to extend contracts to complete development and assembly of the station. Delays in completing the assembly of the station—which will be at least 2 years—are likely to incur significant additional program costs. At the same time, partner funding is uncertain, which may result in NASA paying a larger share of certain program costs.

Although the full impact of the shuttle fleet's grounding on the space station is still unknown, it is clear that the station's future is dependent on the shuttle fleet's return to flight. NASA must carefully weigh this future against the risks inherent in its current culture. As we reported early this year, NASA's organization and culture has repeatedly undermined the agency's ability to achieve its mission. The Columbia Accident Investigation Board similarly found that NASA's history and culture have been detrimental to the shuttle fleet's safety and that needed improvements at NASA go beyond technical enhancements and procedural modifications. The cultural change required for NASA to consider the numerous technical and administrative recommendations made by the Board could be the agency's greatest challenge to date.

In an effort to help NASA as it undergoes this change—and the Congress as it assesses NASA's future corrective actions—we have provided a framework for establishing appropriate operating principles and values and program direction, securing and maintaining a sufficient and skilled workforce, establishing proper performance targets, and ensuring adequate monitoring.