



Highlights of [GAO-08-581T](#), a testimony before the Subcommittee on Space and Aeronautics, Committee on Science and Technology, House of Representatives

Why GAO Did This Study

The International Space Station (ISS), the most complex scientific space project ever attempted, remains incomplete. NASA expects the station's final construction cost will be \$31 billion and expects sustainment costs through the station's planned retirement in fiscal year 2016 to total \$11 billion. The space shuttle, the only vehicle capable of transporting large segments of the station into orbit, is critical to its completion. NASA plans to complete ISS assembly and retire the shuttle in 2010 in order to pursue a new generation of space flight vehicles, which will not begin to be available until 2015. To provide crew rotation and logistical support during this 5-year gap, NASA plans to rely on spacecraft developed by the commercial sector and other countries.

In light of these circumstances, GAO examined the risks and challenges NASA faces in (1) completing assembly of the ISS by 2010 and (2) providing logistics and maintenance to the ISS after 2010.

GAO's work to accomplish this included reviewing budget, planning, and other documents from NASA; reviewing NASA officials' testimonies; and interviewing NASA and foreign space program officials.

To view the full product, including the scope and methodology, click on [GAO-08-581T](#). For more information, contact Cristina Chaplain at (202) 512-4841 or chaplainc@gao.gov.

NASA

Challenges in Completing and Sustaining the International Space Station

What GAO Found

NASA faces significant challenges in its plans to complete assembly of the International Space Station (ISS) prior to the scheduled retirement of the space shuttle in 2010. Since GAO testified on this issue in July 2007, the shuttle flight schedule has remained aggressive—slating the same number of launches in a shorter period. While NASA thinks the proposed schedule is still achievable, the schedule

- is only slightly less demanding than it was prior to the Columbia disaster when the agency launched a shuttle every other month with a larger shuttle fleet and
- leaves little room for the kinds of weather-related, technical, and logistical problems that have delayed flights in the past.

Unanticipated delays could result in changes to the station's configuration, that is, some components may not be delivered. We have previously testified that such changes could limit the extent of scientific research that can be conducted on board the ISS.

After assembly is completed and the shuttle retires, NASA's ability to rotate crew and supply the ISS will be impaired because of the absence of a vehicle capable of carrying the 114,199 pounds of additional supplies and spares needed to sustain the station until its planned retirement in 2016. For crew rotation and logistics, NASA plans to rely on:

- *Russian, European and Japanese vehicles.* These vehicles were designed to augment the capabilities of the shuttle, not replace them, and have far less capacity to haul cargo. Furthermore, aside from a single Russian vehicle that can bring back 132 pounds of cargo, no vehicle can return cargo from the ISS after the shuttle is retired.
- *Commercially developed vehicles.* NASA has pledged approximately \$500 million for the development of commercial vehicles. NASA expects these vehicles will be ready for cargo use in 2010 and crew use in 2012, even though none of the vehicles currently under development has been launched into orbit yet and their aggressive development schedule leaves little room for the unexpected. If one of these vehicles cannot be delivered according to NASA's current expectations, NASA will have to rely on Russian vehicles to maintain U.S. crew presence on the ISS until the new generation of U.S. spacecraft becomes available.

We are not making recommendations as a result of our review as NASA is well aware of the predicament it faces with the station and has weighed options and trade-offs for the remainder of the schedule manifest. However, it is important that flexibility continue to be maintained as events impacting schedule occur and that decisions be made with the goal of maximizing safety and results.