USAF Scientific Advisory Board

FY 2009

Rapid On-Orbit Checkout of Space Systems

Terms of Reference

Background

Long on-orbit checkout periods for newly launched satellites increases the operational cost of space systems and delays the delivery of critical capabilities to the warfighter. In some cases, on-orbit checkout of U.S. Air Force satellites has taken longer than a year. Since satellites are typically built for about 10 years of life, an extended on-orbit checkout period can consume a significant portion of the usable lifetime. In contrast, on-orbit checkout for commercial space systems and for some foreign satellite systems takes considerably less time.

This study will consider the factors that contribute to long on-orbit check-out times, and recommend technology and process solutions to enable rapid on-orbit check-out of space systems. What features in the design of Air Force satellites, systems engineering specifications, and management practices can be changed to reduce the time and cost of initial checkout operations?

Study Products

Briefing to SAF/OS & AF/CC in July 2009. Publish report in December 2009.

Charter

The study will:

- Examine and catalogue the initial operational times of current space systems on orbit, including military, commercial, and other nations' systems.
- Compare the requirements and design features of systems to determine the causes for specific checkout requirements, accounting for different satellite functions and capabilities.
- Identify strategies, design practices, manufacturing criteria, testing requirements, and changes to ground stations and systems that could significantly reduce the time it takes to check out the satellites on orbit.
- Propose improvements in simulation, modeling, testing techniques, and operator training that could ultimately reduce on-orbit calibration and checkout requirements.
- Recommend practical approaches for the near- and mid-term to reduce the on-orbit checkout times of Air Force space systems while assuring their reliability, early availability, and responsiveness.