

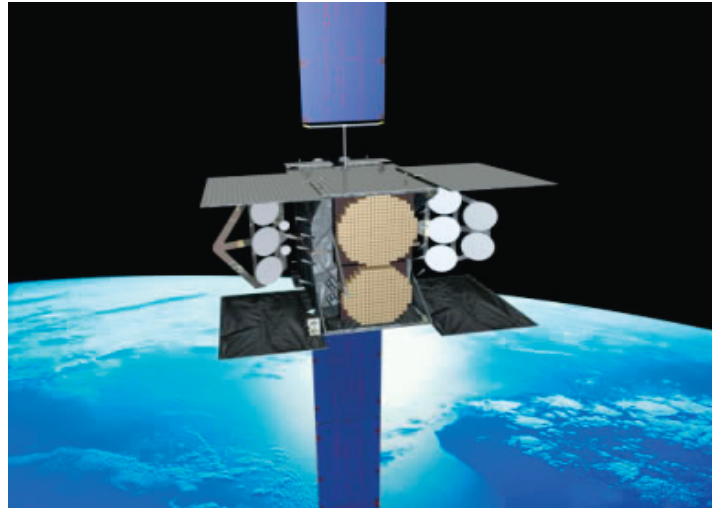
Wideband Gapfiller Satellite (WGS)

Executive Summary

- Recent testing identified problems that could cause a significant delay in the launch of the first Wideband Gapfiller Satellite (WGS).
- The WGS Payload Engineering Model Test bed, used for system testing, was completed in the summer of 2005.
- Test planning for WGS Multi-Service Operational Test and Evaluation is making adequate progress. It will be a test of the integration of the first system satellite.

System

- WGS is the next generation wideband component in the DoD's future military Satellite Communications (SATCOM) architecture, and provides communications in both the X-band and Ka-band frequencies.
- WGS combines vital capabilities onto a single satellite for tactical X-band communications, augments the Global Broadcast Service (GBS) Phase II system, and provides new two-way Ka-band service.
- The WGS system will be composed of three segments:
 - The Space Segment is being acquired by the Air Force in a block of three or more satellites under the Federal Acquisition Regulation Part 12 rules for commercial item acquisition. First launch is projected for FY07 with the second and third launches following in about six-month intervals.
 - The Control Segment equipment and components will be integrated with existing satellite communications control assets to provide an integrated WGS satellite constellation control capability.
 - The Terminal Segment consists of a variety of existing and programmed terminal types acquired under Service and agency terminal programs.



Mission

- Combatant commanders, U.S. joint warfighters, and allied partners will use the capabilities of the WGS space-based communications system for all military operations short of nuclear war.
- The Air Force is introducing this new service to alleviate the spectrum saturation of X-band, and to greatly increase both the available single-user data rate and total satellite capacity over current Defense Satellite Communications System III satellites.
- The Military Satellite Communications Joint Program Director is integrating the WGS and the GBS space and control capabilities.

Activity

- The WGS Payload Engineering Model Test bed began being used for developmental testing in the summer of 2005.
- The WGS Test and Evaluation Working Group updated the overall system test strategy and test program resource allocation in December 2004.
- An initial review of the updated WGS system test plan is in progress.

Assessment

- The initial system test planning for WGS Multi-Service Operational Test and Evaluation is preparing for the integration of the first system satellite. However, the

- pressures of the emerging WGS program schedule could place the periods of dedicated operational testing at risk.
- WGS program risks also continue to exist in the areas of operational frequency reuse, satellite orbital placement, and space launch system availability.
 - WGS testing of the Payload Engineering Model Test bed noted an oscillator problem within the payload channelizer that controls payload switching and crossbanding. The payload channelizer is a vital element in the proper operation of the WGS payload.
 - Recent system quality control testing at the production facility identified a problem with fasteners that were not correctly

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installed in the assembly of WGS Satellite 1. A WGS programmatic delay of at least 12 months is expected in order to replace the fasteners. Inspection of Satellites 2 and 3 will likely be required to verify that those fasteners were properly installed.

- The WGS Multi-Service Operational Test and Evaluation will need to integrate with the testing of the final mission capability requirements of the GBS Phase II and related system programs. The interoperability features of these systems will need to be evaluated.

Recommendations

1. The Air Force and the Combined Test Force should maximize the application of combined developmental and operational

testing for WGS, but preserve the previously scheduled periods needed for dedicated operational testing.

2. The Air Force should continue to carefully control WGS program risks associated with frequency reuse, satellite orbital placement, and launch system availability.
3. The Air Force should integrate the WGS related operating capabilities of the GBS Phase II system into the WGS Multi-Service Test and Evaluation Strategy.