GPS III
Poised for Tomorrow

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GPS III - Ready for New Capabilities

SV11+ requirements baseline
• Inserts new payloads and capability
  • Regional Military Protection
  • Re-designed Nuclear Detonation Detection System
  • Search and Rescue payload
  • Laser Retro-Reflector Array

SV11+ builds on Air Force’s rigorous GPS III acquisition
• Strong Systems Engineering process, discipline and tools
  • Requirements flow-down, mission thread approach
• Comprehensive Mission Assurance standards
  • Technical Operating Requirements (TOR) and MIL-STD design reviews
• Low Risk Capability Insertion
• Simulators, pathfinders, and ‘flight-like’ engineering development units
  • Significant learning curve, reduced issues observed
Upgraded Navigation Payload

SV11 upgrades SV01-10 Mission Data Unit (MDU) for full digital benefits
- Current payload is already 75% digital
- Full digitization for improved manufacturability and affordability
- Digital waveform generators offer superior GPS signal performance

SV11 incorporates high-efficiency, high-power transmitters
- New Linearized Traveling Wave Tube Amplifiers (LTWTAs)
- More efficient to generate needed SV11+ power
Regional Military Protection (RMP)

- SV11 RMP design ready to fulfill pending Capability Development Document (CDD) update
- RMP offers the required steerable M-code power
  - Covers a defined region on earth
- SV11 RMP antenna is designed for reduced complexity and affordability
  - Solution is stowed for launch and deployed on-orbit
Re-designed NDS Payload

SV11 re-design integrates updated NDS assemblies

SV11 NDS baseline interfaces identical to SV01-08

Low-risk NDS integration based on SV01-08 experience

GPS III fully supports improved NDS mission capabilities
Search and Rescue (SAR)

Near instantaneous global coverage with accurate independent location capability

GPS III SAR Accommodations

- Frequency stability for clock distribution for required geolocation accuracy
- UHF receive antenna processes received signals
- Transmit antenna to relay SAR signal to SAR ground stations

Status

- PDR completed 2013
- Further review as part of SV11+ Phase 1
  - Interfaces and requirements understood
Laser Retro-Reflector Array (LRA)

Technology enabling independent orbit determination better than 1 cm accuracy

GPS III LRA Accommodations
- Integrate array of corner cubes that reflect low-power laser pulses off the SV
- Thermally isolated with clear field of view

Benefits
- Compatible with GLONASS and Galileo
- Contributes to precise satellite error source identification

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Summary and Way Ahead

GPS III is in full Production
• Benefitting from pathfinders, simulators, etc.
• MEO qualified, hardened to TOR requirements
• SV sized for additional SV11+ requirements

Future requirements well understood
• SV11+ Hosted payloads through PDR in 2013
• Regional Military Protection adds further anti-jam protection