GPS Program Update

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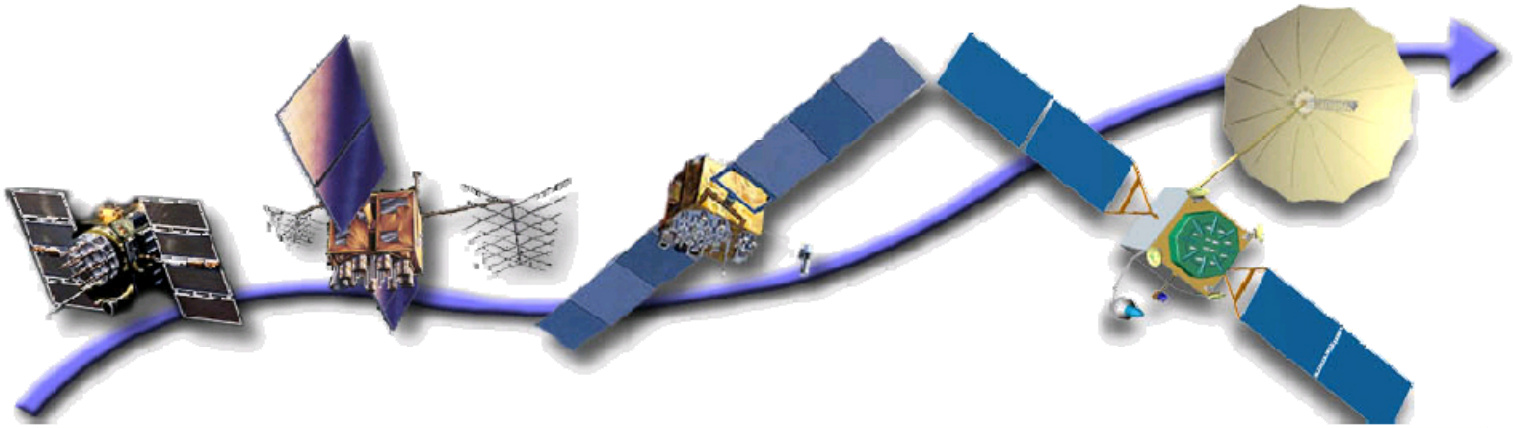
GPS Constellation Status

31 Operational Satellites (Baseline Constellation: 24)

- 11 Block IIA
- 12 Block IIR
- 7 Block IIR-M
  - Transmitting new second civil signal
- 1 GPS IIR-M in on-orbit testing
- 1 Block IIF launched May 27th, 2010
  - First of 12 Block IIF satellites
- 3 additional satellites in residual status
- Global GPS civil service performance commitment met continuously since December 1993

GPS Modernization Program



Increasing System Capabilities w Increasing Defense / Civil Benefit

Block IIA/IIR

Basic GPS

- Standard Service
  - **Single frequency (L1)**
  - Coarse acquisition (C/A) code navigation
- Precise Service
  - Y-Code (L1Y & L2Y)
  - Y-Code navigation

Block IIR-M, IIF

IIR-M: IIA/IIR capabilities plus

- **2nd civil signal (L2C)**
- M-Code (L1M & L2M)

IIF: IIR-M capability plus

- **3rd civil signal (L5)**
- Increased robustness
- Aviation Safety

Block III

- Backward compatibility
- **4th civil signal (L1C)**
- Increased accuracy
- Assured availability
- Navigation surety
- Controlled integrity
- Increased security
- System survivability

GPS Modernization – New Civil Signals

- **Second civil signal "L2C"**
  - Designed to meet commercial needs
  - Higher accuracy through ionospheric correction
  - Available since 2005 without data message
    - Currently, 7 IIR-Ms transmitting L2C
  - After 2020 with L2C and L5 online, the USG will no longer support semi-codeless access to military GPS signals
  - Full capability: 24 satellites ~2016

- **Third civil signal "L5"**
  - Designed to meet demanding requirements for transportation safety-of-life
  - Uses highly protected Aeronautical Radio Navigation Service (ARNS) band
  - On orbit broadcast 10 APR 2009 on IIR-20(M) secured ITU frequency filing
    - Operational on 1st IIF (SVN-62)
  - Full capability: 24 satellites ~2018/19

GPS Modernization – Fourth Civil Signal (L1C)

- **Fourth civil signal "L1C"**
  - Designed with international partners for interoperability
  - Modernized civil signal at L1 frequency
    - More robust navigation across a broad range of user applications
    - Improved performance in challenged tracking environments
    - Original signal retained for backward compatibility
  - Specification developed in cooperation with industry recently completed
  - Launches with GPS III in 2014
  - On 24 satellites by ~2021

GPS III

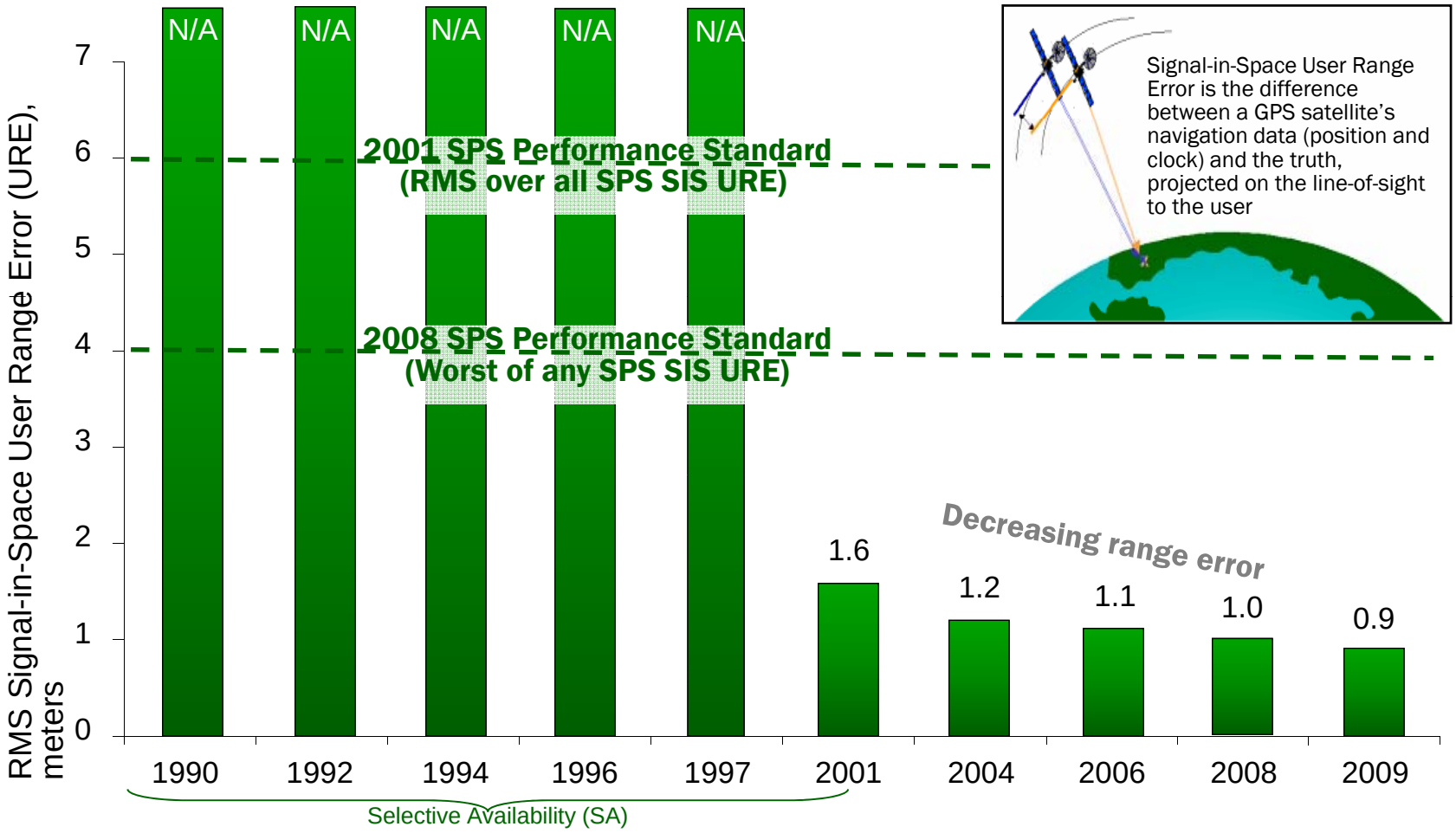
- **Newest block of GPS satellites**
  - First satellite to broadcast common L1C signal
  - Multiple civil and military signals; L1 C/A,L1 P(Y), L1M, L1C, L2C, L2 P(Y), L2M, L5
  - More robust Earth coverage performance
  - Three Rubidium clocks

- **Completed Critical Design Review for Block IIIA**
  - Two months in advance
- **Completed Delta System Requirements Review for Block IIIB**
- **Conducting Analysis of Alternatives for Blocks IIIB and IIIC**

Modernized Operational Control Segment (OCX)

- **Architecture Evolution Plan (AEP)**
  - Transitioned in 2007
  - Increased worldwide commanding capability
  - Increased capacity for monitoring of GPS signals
  - Modern distributed system replaced 1970s mainframes
  - Current software version (5.5D) enabled SAASM functionality
- **Next Generation Control Segment (OCX)**
  - Controls more capable constellation, and monitors all GPS signals
  - $1.5B contract awarded 25 February 2010
  - Capability delivered incrementally to reduce risk
  - On track for Preliminary Design Review in ~April 2011
  - Full Capability by ~2016

SPS Signal in Space Performance



System accuracy exceeds published standard

Summary

- Constellation is aging, but healthy
  - Air Force confident in sustainment plan
- GPS Modernization is on track
  - GPS III progressing ahead of schedule
  - Better capability for GNSS users worldwide
- U.S. Government has provided continuous GPS service since 1993
  - System Performance is better than ever and exceeds published standards

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