Civil GNSS Signal/Service Monitoring

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Benefits of Civil GNSS Signal/Service Monitoring

Proposed ICG Principle

“Every GNSS provider should establish documented civil performance commitments to inform users about minimum levels of service”

Civil GNSS Signal/Service Monitoring provides:

1. The ability to verify commitments to GNSS performance
2. Improve situational awareness for the GNSS operators
   - Verify objectives and thresholds are being met
   - Identify potential for future improvements
3. Provide assurance that civil service failures are detected and resolved promptly
Rationale for Development of the GPS Civil Monitoring Performance Specification (CMPS)

- Identify civil requirements for monitoring of the GPS signals/service

- Identify metrics that address performance measures. Reference authoritative documents whenever possible
  - Described in USG policy statements, and
  - Derived from GPS interface specifications (IS)

- Address current capabilities and those in development
  - L1 C/A, L2C, L5, L1C

- Addresses both Standard Positioning Service (SPS) and Signal-in-Space (SIS)

- Identify and allocate monitoring requirements between “core” system monitoring and other monitoring capabilities
Structure of the CMPS

• Monitoring Requirements; three categories
  1. System performance monitoring (35 requirements)
     ▪ Derived from SPS PS and Federal Radionavigation Plan
     ▪ Verification availability, reliability, and accuracy
  2. Signal monitoring (136 requirements)
     ▪ Primarily derived from the ICDs and ISs
  3. Non-broadcast data (4 requirements)

• Infrastructure Requirements; reporting & archiving (31 requirements)

• Traceability; all requirements captured in the CMPS
  – Simplifies updates as the source documents change
CMPS Development Process and Status

- First release of CMPS; December 1, 2005
  - Referenced in -800 series specifications

- Updated to incorporate latest SPS Performance Standard (September 2008)
  - Reorganized to maintain structure parallel with SPS PS
    - Updated all requirements traceability
    - Traceability to several new standards incorporated

- Updated version of CMPS publicly released on April 30, 2009
  - Available at http://www.pnt.gov
Summary

- Many benefits of GNSS Signal/Service Monitoring to the service provider and user

- Supports proposed ICG principle to establish documented civil GNSS performance commitments to inform users about minimum levels of service
  - Allows service provider to verify performance commitments

- CMPS can be used as a model for documentation of civil requirements for monitoring of the GNSS signals/service

- Allows for identification of the allocation of monitoring requirements between “core” system monitoring and other monitoring capabilities (e.g., augmentation systems)