U.S. International Diplomatic Initiatives and Opportunities on GNSS Issues

National Space-Based PNT Advisory Board 9th Meeting

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U.S. National Space Policy

Space-Based PNT Guideline: Maintain leadership in the service, provision, and use of GNSS

- Provide civil GPS services, free of direct user charges
  - Available on a continuous, worldwide basis
  - Maintain constellation consistent with published performance standards and interface specifications
  - **Foreign PNT services may be used to augment and strengthen the resiliency of GPS**
- Encourage global ***compatibility*** and ***interoperability*** with GPS
- Promote **transparency** in civil service provision
- Enable market access to industry
- **Support international activities to detect and mitigate harmful interference**

Planned Space-Based PNT Systems

- Global Constellations
  - **GPS (24+)**
  - GLONASS (30)
  - Galileo (27+3)
  - Compass (27+3 IGSO + 5 GEO)
- Regional Constellations
  - QZSS (3+)
  - IRNSS (7)
- Satellite-Based Augmentations
  - **WAAS (3)**
  - MSAS (2)
  - EGNOS (3)
  - GAGAN (2)
  - SDCM (3)

Ratification of U.S.-EU GPS–Galileo Cooperation Agreement

- As a matter of policy, the U.S. and European Commission have considered the U.S.-EU GPS-Galileo Agreement to be in force since its signing in June 2004
- All EU Member States accepted legal provisional application since November 1, 2008
- In November 2010, the U.S. was informed that all EU Member States had deposited entry-into-force notes and the U.S. subsequently sent an entry-into-force diplomatic note to the EU Depository on June 6, 2011
- EU Parliament approved Agreement on Oct. 26, 2011
- EU Council now must adopt a "decision of conclusion" and then deposit its entry-into-force note – **expected before end of the calendar year**

Bilateral Consultations (1)

U.S.-EU Cooperation

- May 2011 video conference was the most recent "plenary-type" meeting with the EU
- GPS-Galileo issues discussed at the June 2011 U.S.-EU Space Policy Dialogue in Brussels
- *WG-A:* ITU operator-to-operator coordination meetings September and planned December 2011
  - Focus on GPS III, WAAS and EGNOS
- *WG-B:* October 2011 video conference discussed trade and commercial issues including EU's interest in Lightsquared's potential impacts to GNSS

Bilateral Consultations (2)

U.S.-Russia Cooperation

- *WG1:* June 8, 2011, agenda included detailed presentation on the Russian proposed SBAS known as SDCM, assignment of GPS L1 C/A PRN codes, and GLONASS CDMA signal plans
- *WG2 :* October 31-November 3 meetings in U.S. on research on Distress Alerting Satellite System space/ground segments
- Joint Statement reaffirming intent to continue cooperation signed in September 2011

U.S.-Japan Cooperation

- Annual plenary meeting held in Tokyo, January 13, 2011.
  - Both sides reaffirmed close cooperation on GNSS issues, with no major outstanding problems or issues.
  - Future contribution of QZSS to space-based PNT services of Japan and the important contribution of GNSS cooperation to the peaceful development of the Asia-Pacific region discussed
- Next annual plenary January 17-19, 2012, in Washington, D.C.

Bilateral Consultations (3)

U.S.-China Cooperation

- U.S. and China concluded ITU operator-to-operator coordination on signal compatibility between GPS and COMPASS in Sept. 2010
- Discussions on broader cooperation issues take place during meetings of the International Committee on GNSS (ICG)
- Government officials from both nations participated in a bilateral U.S. National Academy of Engineering and Chinese Academy of Engineering GNSS workshop held in Shanghai, May 2011

U.S.-India Cooperation

- In July, 2011, the U.S. and India convened the third U.S.-India Joint Working Group on Civil Space Cooperation in Bangalore
- Parties agreed to resume work on interoperability between GPS, the Indian GPS Aided Geo Augmented Navigation System (GAGAN),and the proposed Indian Regional Navigational Satellite System (IRNSS)

International Committee on Global Navigation Satellite Systems (ICG)

- Emerged from 3rd UN Conference on the Exploration and Peaceful Uses of Outer Space July 1999
  - Promote the use of GNSS and its integration into infrastructures, particularly in developing countries
  - Encourage compatibility and interoperability among global and regional systems
- Members include:
  - **GNSS Providers** (U.S., EU, Russia, China, India, Japan)
  - Other interested Member States of the United Nations
  - International organizations/associations

http://www.unoosa.org/oosa/en/SAP/gnss/icg.html

ICG-6 Outcomes

The 6th meeting of the ICG, to include the Providers Forum and four working groups, was hosted by the Government of Japan in Tokyo, September 5-9, 2011

- Development of Multi-GNSS monitoring networks were a major topic of discussion
  - ICG endorsement of the IGS Multi-GNSS Experiment
  - Subgroup will be formed to collectively investigate international GNSS monitoring and assessment
- Templates describing the geodetic and timing references for all systems have been completed and will be available on the ICG website
- Subgroup to be formed which will focus on GNSS applications

U.S. Contributions to ICG-6

- Presentations:
  - U.S. system and policy update
    - Including information on the status of the LightSquared authorization
  - Earthquakes and Other Natural Hazards: GNSS for Disaster Management
  - FAA GNSS Update
- Proposals:
  - Potential improvements to the ICG's web site
  - Joint Japan-U.S. Recommendation for an Interference Detection and Mitigation (IDM) Workshop was approved by the Committee
    - Time and location still to be determined
  - Recommendation for GNSS service providers to define the Space Service Volume (SSV) was approved

APEC GNSS Implementation Team

- Established by the APEC Transportation Working Group in 2000
- Mission is to promote implementation of regional GNSS augmentation systems to enhance inter-modal transportation, by:
  - Expediting the implementation of GNSS in all economies
  - Advancing the development of an Asia Pacific approach to GNSS implementation to encourage cooperation that will enhance safety and efficiency
  - Seeking from all economies the expertise to ensure the success of GNSS implementation
  - Cooperating with non-APEC organizations as necessary to provide for seamless implementation

Current Action Areas for GNSS Implementation Team

- Developing project proposals in four areas:
  - Regulatory Roadmap for Performance Based Navigation (Aviation) – USA
  - Multi-GNSS Constellation – Japan
  - Regional Receiver Autonomous Integrity Monitoring (RAIM) Prediction System – Thailand
  - Space Based Augmentation System Cooperation Opportunities – Korea
- October 3, 2011, Workshop on "GNSS Applications for Seamless Transport Supply Chain Connectivity in APEC" held at Vladivostok, Russia
  - Supply chain and logistics-related presentations proposed working for unified standards in package tracking, border crossing (customs) and other traffic/logistics-related applications.

Summary

- U.S. Space-Based PNT Policy and GPS constellation remain reliable foundations for all civil users
- The U.S. actively engages in bilateral, and multilateral cooperation on satellite navigation issues
- Good progress on compatibility and basic interoperability issues
- Open to considering suggestions on how non-U.S. space-based PNT services may be used to augment and strengthen the resiliency of GPS