GNSS International Activities Update: Multilateral and Bilateral Issues

National Space-Based Positioning Navigation and Timing (PNT) Advisory Board: 17th Meeting

Office of Space and Advanced Technology
Bureau of Oceans, and International Environmental & Scientific Affairs
U.S. Department of State

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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 complement services from 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+3)
  - GLONASS (24+)
  - GALILEO (24+3)
  - BDS/BEIDOU (27+3 IGSO + 5 GEO)

- Regional Constellations
  - QZSS (4+3)
  - IRNSS/NAVIC (7)
- Satellite-Based Augmentations
  - WAAS (3)
  - MSAS (2)
  - EGNOS (3)
  - GAGAN (3)
  - SDCM (3)

U.S. Hosted 10th ICG Meeting (ICG-10): 1-6 November 2015

- Meeting held in Boulder, Colorado at University Corporation for Atmospheric Research (UCAR)
- More than 200 participants
  - Representatives from 28 countries/organizations
  - Representation from all 6 GNSS Providers
- Panel of Experts Session
  - GNSS: Today and Preparing for the Future
- Applications and Experts Session
  - Observing Earth Processes using GNSS
- Local Tours Included:
  - National Space Weather Prediction Center
  - Time and Frequency Laboratory
  - UNAVCO (facilitates geoscience research and education using geodesy)

UCAR Center Green Facility

PNT Advisory Board Participation in ICG-10

- 13 Advisory Board Members Participated in ICG-10
- Plenary Presentation on Advisory Board Activities
- Panel of Experts Session
- ICG-10 Recommendation from Working Group C:

  It is proposed that ICG member countries consider the value of National and Regional PNT Advisory Committees and share their findings at ICG meetings when available

The Contributions from All Participating Advisory Board Members was Greatly Appreciated!

ICG-10: Significant Accomplishments and Recommendations

- Interference Detection and Mitigation (IDM) & Spectrum Protection
  - Recommendation for Providers to promote the implementation of protection measures of GNSS operations around the world
  - Recommendation for ICG presentation to UN Committee on the Peaceful Uses of Outer Space (COPUOS) - Focused on National Efforts to protect RNSS Spectrum, and pursue Interference Detection and Mitigation in Member States
- Interoperability
  - Discussion about GNSS system time and signals, based on 5 system provider workshops held between 2013 and 2015
- International Multi-GNSS monitoring (IGMA)
  - Existing civil service centers working to establish a link to a new ICG web portal allowing users to easily find GNSS monitoring information and products
  - Recommendation to initiate a trial project between the ICG and IGS to demonstrate a global GNSS Monitoring and Assessment capability

ICG-10: Significant Accomplishments and Recommendations (continued)

- Space Service Volume (SSV)
  - Progress on developing definitions and assumptions for an interoperable SSV
  - Providers to report on new Spaceborne GNSS receiver developments within their region
- Space Weather
  - Presentation/discussion on new U.S. Space Weather Strategy (includes section on international cooperation)
- Orbital Debris Mitigation
  - U.S. presentation on orbital debris strategies in Medium Earth Orbit (MEO)
- Service Center Cooperation
  - Recommendation to develop a template for cooperation between GNSS provider user information centers

ICG Experts Meeting and Seminar on Spectrum Protection & IDM

- Organized by UN Office for Outer Space Affairs (OOSA), through its Program on GNSS Applications
  - Held at UN Vienna International Centre, December 14-18, 2015
  - Approximately 60 experts participated, representing 33 countries/organizations
- Two Day Seminar on Spectrum Protection and IDM
  - Organized and presented by experts from U.S., EU, Japan & ITU
  - Objective: Provide an overview of GNSS spectrum protection and management with a focus on developing nations and other non-GNSS providers
  - Agenda topics included
    - Introduction to GNSS
    - Spectrum Management
    - Spectrum Protection
    - Interference Detection and Mitigation

Other International Activities/Events

The U.S. participated in the following GNSS events (since the November AB Meeting):

- Civil GPS Service Interface Committee (CGSIC) International Meeting in Kyoto, Japan – November 2015
- International GNSS Service (IGS) 2016 Workshop in Sydney, Australia – February 2016
- Munich Satellite Summit – March 2016
- APEC GNSS Implementation Team Meeting in Papua New Guinea – April 2016
- Royal Institute of Navigation Vulnerabilities Conference in Baska, Croatia – May 2016
- China Satellite Navigation Conference in Changsha, China – May 2016

Bilateral GNSS Cooperation

- *Europe:* GPS-Galileo Cooperation Agreement signed 2004
  - ITU compatibility agreement between GPS and Galileo: 2014
  - Space Cooperation Dialogue held in Washington – Dec. 2015
  - Working Groups continue to meet on a regular basis
- *China:* Most recent civil GNSS Plenary – Jun. 2015
  - Sub-groups on compatibility and interoperability and augmentations and aviation applications are meeting May 16-19
- *Japan:* Civil Space Dialogue held in Tokyo – Sep. 2015
  - U.S. hosts QZSS monitoring stations in Hawaii and Guam
- *India:* Civil Space Joint Working Group Meeting in Bangalore – Sep. 2015
  - Discussion on emerging IRNSS/NAVIC and spectrum use
  - ITU compatibility coordination completed

Additional Bilateral Cooperation Related to Space and PNT

- *Canada:* Civil GNSS meeting held in Ottawa – May 2015
  - Agreed to expand cooperation on interference detection and mitigation, jammer enforcement, and geodetic network ground station coverage in Canada
- *Republic of Korea:* 2nd bilateral Civil Space Dialogue held in Seoul – Apr. 2016
  - Discussion about Korea's development of their SBAS
- *Vietnam:* First U.S.-Vietnam Civil Space Dialogue held in Washington – Dec. 2014
- *Australia:* Joint Delegation Statement on Cooperation in the Civil Use of GPS in 2007
  - Last formal space bilateral meeting held in Oct. 2010

Summary

- U.S. policy encourages the worldwide use of civil GPS services and cooperation with other GNSS providers
  - Compatibility, interoperability, and transparency in civil service provision are priorities
- U.S. hosted ICG-10 meeting was a success with progress on multilateral cooperation in the areas of interference detection and mitigation, interoperability and civil signal monitoring
- International outreach is a priority, through participation in public events and multilateral fora

Backup Slides

U.S. Federal Communications Commission (FCC) Part 25 Rules

- FCC Part 25 rules require licensing of non-Federal* receive-only Earth stations (receivers) operating with Non-U.S. Licensed Space Stations (satellites) [47 CFR § 25,131(j)(1), 25.137]
- These rules were established in 1997, when the FCC's regulatory policies were amended by a Report and Order to allow non-U.S. licensed satellites to provide service in the United States [IB Docket No. 96-11, 12 FCC Rcd 24094 (1997) (*DISCO II Order*)]
- By letter of March 2, 2011, to the FCC, the National Telecommunications and Information Administration (NTIA), on behalf of the Executive Branch, outlined the criteria it will apply in considering whether to recommend waiver of the FCC rules.
- The FCC will also continue to accept requests filed through previously established licensing and waiver procedures

To date the FCC has not approved licensing or waiver of its Part 25 rule to allow use of multi-GNSS receivers in the U.S.

** The FCC Part 25 rule does not apply to Federal Government Use of Multi-GNSS receivers*

Executive Branch Position on FCC Part 25 Rule

- The process for considering a waiver request from a foreign government will be initiated through a consultation with the U.S. Department of State
- Considerations (criteria):
  1. Grant of a waiver is in the public interest
  2. System complies with United Nations Space Debris Mitigation guidelines
  3. Grant of a waiver is consistent with U.S. international trade and other treaty obligations
  4. Waiver request is limited to receive-only RNSS (which includes positioning) and standard time and frequency satellite services
  5. Operation of the RNSS signals offered by the foreign RNSS system has been found compatible with U.S. government systems operating in the specified RNSS frequency bands
- The FCC will issue a public notice providing an opportunity for comment prior to taking action on a request
- The FCC will review the NTIA request for **compatibility** with non-Federal U.S.-licensed systems