



U.S. International Activities Update: Multilateral and Bilateral Advances

National Space-Based Positioning Navigation and Timing (PNT) Advisory Board: 18th 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 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)





11th Meeting of the International Committee on GNSS (ICG-11)



- Multilateral meeting hosted by the Russian Federation in Sochi
- More than 100 participants
 - Representatives from 21 countries/organizations
 - Representation from all 6 GNSS Providers
- Agenda included:
 - Meeting of the Providers' Forum
 - System Provider Updates
 - Applications and Experts Session
 - Meeting of all four Working Groups





PNT Advisory Board Participation in ICG-11

- Dr. Parkinson Made a Plenary presentation on Advisory Board Activities
 - Focused on adjacent band interference issue
 - Renewed push for other GNSS Providers to consider similar advisory board arrangements of their own
- Dr. Rashad participation representing the Arab Institute of Navigation

Advisory Board Member participation at ICG Meetings is welcome and helps to underscore the importance of the advisory board concept!



ICG-11: 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
 - Proposal for ICG Secretariat to deliver a communication to select members of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) - Focused on National Efforts to protect RNSS Spectrum, with a request for member states to report their regulations and report on efforts to mitigate interference
 - 6th IDM workshop to take place in May 2016 in Croatia
- International Multi-GNSS monitoring (IGMA)
 - Recommendation for an ICG workshop to be held in May 2017 to discuss the multi-GNSS monitoring trial project established in 2016 between the ICG and IGS, and discuss the need for GNSS signal quality monitoring
- Interoperability – Timing
 - Recommendation for ICG expert level workshop to be held in 2017 to further discuss GNSS system time offsets among the systems



ICG-11: Significant Accomplishments and Recommendations (continued)

- Space Service Volume (SSV)
 - SSV Booklet to be released in early 2017 – results of completed simulations used to develop definitions and assumptions for an interoperable SSV
 - Outreach activities scheduled in 2017 to highlight the importance of the ICG work taking place and the benefits of an interoperable SSV
- Signal Patents
 - Recommendation for nations to ensure that open signal structure patents are discouraged and not used for the collection of royalties
- Search and Rescue (SAR)
 - Presentations from 3 GNSS providers on SAR implementation status – recognition by providers of the importance of having interoperable SAR services
- Space Weather
 - Discussion about ionospheric models – will be further discussed at future ICG meetings



ICG Meetings

Past ICG Meetings

- ICG-1: UN Vienna, Austria – November 2006
- ICG-2: Bangalore, India – September 2007
- ICG-3: Pasadena, CA, **U.S.** – December 2008
- ICG-4: St Petersburg, Russia – September 2009
- ICG-5: Turin, Italy – October 2010
- ICG-6: Tokyo, Japan – September 2011
- ICG-7: Beijing, China – November 2012
- ICG-8: Dubai, UAE – November 2013
- ICG-9: Prague, Czech Republic – November 2014
- ICG-10: Boulder, CO, **U.S.** – November 2015
- ICG-11: Sochi, Russia – November 2016

Future Meetings

- ICG-12: Japan – December 2017
- ICG-13: China – 2018
- ICG-14: India – 2019
- ICG-15: UN Vienna, Austria - 2020

<http://www.unoosa.org/oosa/en/ourwork/icg/icg.html>



Other International Activities/Events

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

- Multi-GNSS Asia (MGA) meeting – November 2016
- Canadian Federal GNSS Coordination Board Workshop – October 2016
- International Association of Geodesy GNSS+ 2016 Conference – July 2016
- Prague Space Security Conference – June 2016
- European Space Solutions 2016 – May/June 2016

SBAS PRN Codes

- U.S. working with ICAO on development of a process for allocating SBAS Pseudorandom Noise (PRN) Codes
 - Managed by GPS Directorate to prevent unnecessary mutual interference



Bilateral GNSS Cooperation

- *Europe:* GPS-Galileo Cooperation Agreement signed 2004
 - Working Group on Next Generation GPS/Galileo Civil Services meets twice per year – most recent meeting Oct. 2016
 - Working Group on Trade & Civil Applications met Mar. 2016
 - PRS access negotiations are underway
- *China:* Most recent civil GNSS Plenary – Jun. 2015
 - Sub-group on compatibility and interoperability met Sep. 2016 in Portland, OR
 - GNSS discussed at U.S.-China Civil Space Dialogue – Oct 2016
- *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
 - ITU compatibility coordination completed



Additional Bilateral Cooperation Related to Space and PNT

- ***Canada:*** Civil GNSS meeting held in Ottawa – May 2015
 - U.S. participated in Federal GNSS Coordination Board Workshop on GNSS policy, vulnerabilities and mitigation – Oct 2016 in Ottawa
- ***Republic of Korea:*** 2nd bilateral Civil Space Dialogue held in Seoul – Apr. 2016
 - Discussion about Korea's development of their SBAS
- ***Ukraine:*** U.S.-Ukraine Civil Space Dialogue held in Washington – May 2016
- ***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. continues to support the ICG and is pleased with the progress made at ICG-11, especially in the areas of interoperability, spectrum protection 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