



Update on GNSS Issues at the United Nations

Sergio Camacho

Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, affiliated to the United Nations

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- Progress in the use of Multi-GNSS
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Multi-GNSS – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

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The STSC noted that,

- GPS continued to be a central pillar in an **emerging international system of GNSS**, and that the United States remained engaged in activities to ensure both compatibility and interoperability among the different services.
- The interface control document for GLONASS Code Division Multiple Access signals in bands L1, L2 and L3 had been published in English and that an open service was being developed to provide a basic performance standard for the system's users aimed at making GLONASS an essential element of **the international GNSS infrastructure**.



Multi-GNSS - Space Service Volume – Report of the International Committee on GNSS - 2017

In December 2017, the ICG noted that

- The Working Group on the Enhancement of GNSS Performance, New Services and Capabilities is progressing in establishing an interoperable GNSS Space Service Volume (SSV).
- GNSS SSV and potential augmentations can be seen as an enabler for many ambitious missions and activities in the context of space exploration going beyond low Earth orbit to the Moon, Mars and other celestial bodies
- The excellent cooperation among all members of the SSV action team allowed it to prepare a final draft of the SSV booklet that will be submitted to the GNSS Providers for review and endorsement of the SSV booklet for publication in time for the UNISPACE+50 High-Level segment of the 2018 session of COPUOS (20 -21 June).



Satellite-aided search and rescue programme

The Subcommittee noted that:

- Cospas-Sarsat, for which the Medium-altitude Earth Orbit Search and Rescue (MEOSAR) distress signals relayed by GNSS satellites were in early operational capability, had been used in search and rescue efforts.
- The MEOSAR system was using upgraded GPS satellites as well as GLONASS and Galileo satellites and provided near-instantaneous distress alerts and locations as well as significantly more satellites compared with the current constellations used in search and rescue.
- China was considering joining and contributing to that worldwide search and rescue capability.



Spectrum Protection and IDM – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

Last year - International Spectrum Protection at COPUOS begins:

In February 2017, the Scientific and Technical Subcommittee (STSC) of COPUOS **welcomed the ICG proposal** that beginning in 2018, Member States of the UN should be invited to report on a voluntary basis on:

- (a) National RNSS Spectrum Allocations and Consistency with ITU Allocations;
- (b) Regulations regarding Non-licensed emissions limits from Radio-frequency (RF) emitters and non-emitters;
- (c) Planned or Existing Laws and Regulations related to the manufacture, sale, export, import, purchase, ownership, and use of GNSS jammers; and
- (d) Domestic efforts to detect and mitigate GNSS interference, with the overall goal of promoting effective use of GNSS open services by the global community.

In 2017, two MS reported on the above: China & USA



Spectrum Protection and IDM – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

In February 2018, the STSC

- Noted the progress made by ICG, especially in the area of compatibility and interoperability among the GNSS systems and in the area of GNSS spectrum protection and interference detection and mitigation (IDM). **As in 2017**
- Recalled that ICG had invited an exchange of information related to GNSS spectrum protection and IDM under its agenda item on “Recent Developments in GNSS”. **As in 2017**
- **In 2018, 10 MS reported on the above:** China, Egypt, India, Indonesia, Israel, Japan, Pakistan, the Republic of Korea, the Russian Federation, Spain and the United States
- Noted the need to ensure continuous reception of GNSS signals and importance of the topic. **New in 2018**



Spectrum Protection and IDM – Report of the International Committee on GNSS - 2017

In December 2017, the ICG noted that

- The Working Group on Systems, Signals and Services (Working Group S) completed its 2016 - 2017 activities
 - Recommendation: ICG members to encourage national regulators to protect Radio Navigation Satellite Service spectrum from the unwanted emissions.

But need much more awareness and capacity building (policy and technical)

- The Working Group continued outreach and education efforts on spectrum protection by holding an Experts Seminar on GNSS spectrum, in conjunction with a United Nations/Argentina GNSS regional workshop (19 – 23 March 2018)



Spectrum Protection and IDM – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

The Subcommittee noted that

- The full Galileo constellation would consist of a total of 30 satellites and was expected to be completed by 2020.
- The Galileo Security Monitoring Centre was facilitating the centralization of access to the Galileo Public Regulated Service and providing Galileo with security monitoring services in order to detect events, caused either accidentally or deliberately, that could result in the disruption of services. **(IDM)**



Individual GNSS – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

The STSC noted that,

- Four satellites of a new generation of satellites, the BeiDou-3 system, had been launched, and 18 satellites were scheduled to be launched by the end of 2018 to provide navigation and positioning services to countries involved in the Belt and Road Initiative.
- The BeiDou-3 system transmitted with a positioning accuracy of between 2.5 and 5 m. The BDS industry chain had been completed, and BDS chips were used on a large scale, with the processing precision refined to 28 nm.
- The sixth version of the BDS interface control document, one open service performance standard and the BDS white paper had been published.



Belt & Road Spatial Corridor

65 countries along the 'Belt&Road': Synergize economic and social development strategies of various countries

East Asia & ASEAN: 10 countries, West Asia: 18 countries, South Asia: 8 countries, Central Asia: 5 countries, CIS: 7 countries, Central and Eastern Europe: 16 countries





Individual GNSS – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

The STSC noted that,

- India was implementing its satellite navigation programme: the Indian Regional Navigation Satellite System (IRNSS): 3 satellites in geostationary orbits and 4 in geosynchronous orbits,
- The GPS-aided Geostationary Augmented Navigation System (GAGAN), a satellite-based augmentation system certified for Navigation Performance, 0.1 Nautical Mile service level and for Approach with Vertical Precision certification by the Directorate General of Civil Aviation of India
- GAGAN was the first satellite-based augmentation system to serve the equatorial region



Individula GNSS – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

The STSC noted that,

- Japan was constructing a Quasi-Zenith Satellite System (QZSS), named “Michibiki”, a navigation satellite system that was compatible and interoperable with GPS
- QZSS would be expanded and upgraded to become an operational regional system to improve positioning in the Asia-Pacific region. A constellation of four satellites would be established and the formal operation would begin during the 2018
- A constellation of 7 satellites would be completed by around the 2023



Individual GNSS – Report of the Scientific and Technical Subcommittee (STSC) of COPUOS - 2018

The STSC noted that,

- The Korean satellite-based augmentation system development, implementation and establishment programme, called “Korea Augmentation Satellite System” (KASS), had initiated in 2014 to improve the performance, reliability and accuracy of the GPS navigation signals in the Korean peninsula
- KASS would consist of 7 reference stations, 2 processing stations, 2 control stations, 3 uplink stations and 2 geostationary satellites, and would meet ICAO’s Approach with Vertical Guidance (APV-I) requirements.
- Following the KASS programme, the Korea Positioning System, would be built, and become a regional provider of GNSS service.
- Open service would initiate in 2020 and the safety of life service would initiate by the end of 2022.



ICG Information Centres

The Subcommittee noted that

- ICG information centres, hosted by the regional centres for space science and technology education, affiliated to the UN, are establishing a network of institutions involved or interested in GNSS.
- The main objective is to enhance the capabilities of member States in using GNSS and related applications to advance their scientific, economic and social development.
- The centres coordinate their activities closely with ICG and its Providers' Forum through the Office for Outer Space Affairs.



Thank you

Comments, Questions?