

REPORT ON THE NINTH MEETING OF THE INTERNATIONAL COMMITTEE ON GLOBAL NAVIGATION SATELLITE SYSTEMS (ICG-9)

Prague, Czech Republic, November 2014

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INTRODUCTION

The Ninth Meeting of the International Committee on Global Navigation Satellite Systems (ICG) was held in Prague, Czech Republic from 9 to 14 November 2014. The ICG has been formed as a result of recommendations of the UN Committee on the Peaceful Use of Outer Space (COPUOS), as ratified by the General Assembly of the UN. The International Federation of Surveyors (FIG) is an Associate Member of the ICG. I was there as the FIG representative to UNOOSA. Unfortunately, Matt Higgins could not be present but he is FIG's co-chair for Working Group D on Reference Frames, Timing and Applications. This meeting was the biggest ICG-meeting ever with more than 200 people attended the meeting with representatives from all of the GNSS/RNSS providers. There were also many representatives from other countries and non-government organisations. It is interesting to see how many delegates that are coming from Russia and China to these meetings as well as note how these meetings are growing in terms of attendance.

JOINT STATEMENT FROM ICG-9

At the end of each meeting, the ICG issues a Joint Statement outlining the highlights of the broad scope of work across the ICG. Various presentations were made at the plenary sessions and working group sessions of the meeting and they form a very useful snap shot of the state of the art with the various GNSS and also with issues across key user groups. The Joint Statement from ICG-9, Working Group Reports and all presentations are available on the ICG Information portal.

(see www.oosa.unvienna.org/oosa/en/SAP/gnss/icg/meetings.html).

REPORTS ON THE STATUS OF ALL OF THE MAJOR GNSS SUB-SYSTEMS

The system providers are at the core of the overall work of the ICG and a feature of the first Plenary Session of the ICG is a series of presentations on the status of all of the major GNSS sub-systems. Presentations also outline the views of each of the system provider nations on

the issues of Compatibility and Interoperability. At ICG-9, the reported status System developments to note at ICG-8 include:

- European Community started by presenting the status of EGNOS (its SBAS) and Galileo:
 - Galileo reported on a stable seven year perspective concerning budget as well as a new governance.
 - There are 26 satellites ordered (4 IOV + 22 FOC) as well as launcher service contracts including Soyuz and Ariane 5
 - Galileo satellites 5 and 6 are in stable condition even though not in expected orbit.
 - The services to be provided by Galileo include the Open Service, Public Regulated Service, Search and Rescue Service, Commercial Service.
 - The EGNOS data access service was declared operational in July 2012
 - Web site: ec.europa.eu/galileo

- US presented the status of GPS
 - The US policy is to provide continuous worldwide access for peaceful uses, free of direct users charge as well as encourage compatibility and interoperability with other GNSS services and promote transparency in civil service provisioning.
 - On Oct 29 the forth GPS satellite was launched during 2014. Most GPS launches in a single year since 1993. This means that currently 30 operational satellites are available. Global GPS civil service performance commitment has been met continuously since December 1993.
 - Web site: <http://www.gps.gov/>

- The Russian Federation presented the status of GLONASS
 - The civil services are free to use and available globally.
 - The GLONASS programme concept was adopted 3rd of March, 2012. It covers 2012-2020 including a budget.
 - 28 satellites have been launched and 24 satellites are currently operational with two GLONASS-M launches during 2014.
 - Web site: <http://www.glonass-center.ru/en/>

- China presented the status of Beidou:
 - Currently 14 operational satellites (5 GEO, 5 IGSO and 4 MEO).
 - Further statements that Beidou provide continuous, stable and worldwide services and that Beidou belongs to China as well to the world!
 - Web site: <http://en.beidou.gov.cn/>

- India presented the status on GAGAN and IRNSS
 - GAGAN stands for GPS Aided GEO Augmentation Navigation System.
 - GAGAN is compatible and interoperable with other SBAS. Main focus concerns civil aviation to ensure better air space management and fuel efficiency.
 - GAGAN includes 3 GEO satellites, 3 uplink stations and 2 control centres. Two of the satellites have been sent up and GSAT-15 to be launched in 2-3 years from now.

- IRNSS is an independent regional navigation system that will include 7 satellites of which three are GEO and four are GEO synchronous orbits. Full constellation is expected by the end of 2015.
- Web site: <http://irnss.isro.gov.in>
- Japan presented their progress regarding the Quasi Zenith Satellite System (QZSS). Basically very much the same as last year.
 - The first QZSS satellite Michibiki will be followed by three more and the service will start latest 2018.
 - The Government of Japan has decided to accelerate the deployment of the operational QZSS as expeditiously as possible.
 - In the future a seven satellite constellation shall be completed to enable sustainable positioning.

OTHER ISSUES TO NOTE FROM THE MEETING

There were many other presentations, discussions and decisions at the meeting and the following is an outline of some that the author found particularly interesting:

- FIG presentation on the FIG Manual from the FIG Technical Seminar on Reference Frame at the working group C meeting. The cooperation ICG and FIG was mentioned several times in plenary sessions as well
- The proposed UN resolution on Global Geodetic Reference Frame for sustainable development was presented and a statement was made through a recommendation.
- The new ITRF realisation to be released during 2015
- IGS update and the IGS 20th anniversary
- Impact of a possible redefinition of coordinated universal time in GNSS interoperability
- User perspective and applications describe through several presentations

MEETINGS OF WORKING GROUP D AND ITS TASK FORCES ON GEODETIC AND TIMING REFERENCES

The working group had three meetings during the week. The minutes from Working Group D and other Working Groups will be available from the ICG web portal in due course as well as other official documents as e.g. recommendations and all presentations. The main outcomes from the Working Group D were:

- The first key outcome from the meeting was the related discussion and proved improvements regarding the time offset between Glonass time and UTC as well as Beidou time and UTC
- The second key is the update on WGS-84 by the US as well as the discussion on changing from classical horizontal datum to an ITRF based realization.
- The third key outcome is the discussion concerning the implementation of the previous recommendations by ICG and the Working Group D
- The fourth key outcome from the meeting was a series of recommendations which were later accepted by the ICG and its Provider's Forum on the following topics:

- WG-D Recommendation #22 - ICG support to the UN General Assembly Resolution on the *Global Geodetic Reference Frame for Sustainable Development*
- WG-D Recommendation #23 – Improving the accuracy of multi-GNSS orbit determination by the IGS, via detailed satellite information

NEXT MEETINGS OF THE ICG

The US will host ICG-10 in Boulder, Colorado on the 1-6 November, 2015. Venue will be the University Corporation for Atmospheric Research (UCAR).

Russia expressed interest in hosting ICG-11 in 2016.

Japan expressed interest in hosting ICG-12 in 2017.