

**United Nations/United States of America International Workshop on
The Use and Applications of Global Navigation Satellite Systems
8-12 December 2003, Vienna, Austria**

1 Introduction

The United Nations/USA International Workshop on the Use and Applications of Global Navigation Satellite Systems (GNSS) was held from 8 to 12 December 2003 at the United Nations Office at Vienna, Austria. This report draws heavily on the Summary Report produced by staff of the UN Office for Outer Space Affairs (UN OOSA).

The event was convened as a Joint Meeting of the UN Action Team on GNSS and GNSS experts who attended UN/USA Regional Workshops and the International Meeting held in 2001 and 2002. Matt Higgins, Chair of FIG Commission 5 attended representing FIG as a member of the UN Action Team.

The Workshop was attended by 75 participants from 29 countries and 9 international organizations (International Telecommunication Union (ITU), European Commission, European Space Agency (ESA), Bureau International des Poids et Mesures (BIPM), International Association of Geodesy (IAG), International Cartographic Association (ICA), FIG, International GPS Service (IGS) and the UN OOSA.

2 Presentations

The Workshop was briefed on the latest developments with Global Positioning System (GPS USA), Glonass (Russia), Galileo (European Union), and the major GNSS augmentation systems such as EGNOS, GAGAN and Japanese GNSS augmentations, as well as the GPS-Galileo negotiations.

The Workshop heard presentations on regional geodetic reference frame initiatives such as AFREF (Africa), SIRGAS (South America) and EUPOS (the proposed RTK/DGPS service in Eastern Europe).

There was a series of presentations on initiatives at national level to coordinate GNSS activities that might provide models for other countries to consider. Countries presented included; Slovakia, Colombia; Hungary; Italy, Romania, Poland and work by Nigeria to develop its own satellite navigation payload for SBAS for the benefit of Africa. Matt Higgins made a presentation on behalf of the Australian GNSS Coordination Committee (AGCC). The Workshop stressed the importance of supporting the efforts, particularly in developing countries, to establish national coordination mechanisms to promote and support the use and applications of GNSS.

The Workshop considered results from the series of UN/USA Regional Workshop and International Meeting held in 2001-2002; grouped in the following 5 areas:

- Surveying, mapping and Earth sciences;
- Agriculture and management of natural resources,
- Management of environment and natural disasters;
- Transportation;
- Education, training and implementation.

The Workshop established working groups to address those five thematic areas and undertake the following tasks:

- identify any initiatives or follow-up actions undertaken to date
- identify any outstanding recommendations and suggest the way forward
- identify recommendations requiring assistance from the Office for Outer Space Affairs in 2004-2005 and prioritize those recommendations.

The working groups met (intermingled with sessions with relevant presentations) from 9 to 11 December.

3 Results of the Working Group on Surveying, Mapping and Earth Sciences

István Fejes (Hungary) chaired the working group with William Martínez-Díaz (Colombia), Chee Hua Teng (Malaysia), Reynold Moyo (Zambia) and Ruth Neilan (International GPS Service) as vice-chairs. Experts from 15 countries and 4 international organizations (including FIG) participated in the working group.

The working group made 12 recommendations, which were grouped into 3 categories, i.e. projects, standards and general policy.

The working group noted that GPS-based ground geodetic networks (infrastructures) were among the backbones and basic preconditions of most GNSS applications, not only in the area of surveying, mapping, earth sciences, but also in the areas of transport, environmental protection, agriculture and others. The working group, therefore, strongly recommended initiatives to develop such infrastructures. In this context, the working group recommended that the AFREF project in Africa, the EUPOS project in Central and Eastern Europe, the SIRGAS project in South America and the APRGP project in the Asia-Pacific region should be supported.

The working group stressed the importance of the application of global standards in the area of Spatial Data Infrastructure. The working group recommended that all regional and national geodetic datums should be tied to the International Terrestrial Reference Frame (ITRF). The working group urged measures to protect GNSS frequency bands from harmful interference. The working group also considered it important to provide support for developments of precise geoid models in order to assist unification of leveling networks by GNSS.

The working group also considered some cross-cutting issues, including the need to support establishment of national or regional institutional frameworks for coordination, planning and applications of GNSS. The working group recommended that governments should support the development of GNSS ground-based infrastructures at national level. The working group also suggested eight actions that could be implemented by the Office for Outer Space Affairs in the next two years.

4 Follow-up to the recommendations of the working groups: next steps

To facilitate follow-up actions and exchange of information, it was agreed that OOSA would establish a web site for the Workshop. That web site would include: all presentations; reports of the working groups, including all proposals and recommendations; list of potential funding sources to be identified; and major international and regional policies that indicate priorities of the international community or region.

Participants of the Workshop will work more on outlines of the proposed projects and activities with a view to presenting them to potential funding sources.

Between December 2003 and February 2004, OOSA will review and evaluate the proposals submitted by the working groups and develop a work plan for initiatives that it could support in 2004 and 2005. OOSA aims to circulate the work plan by the beginning of March 2004.

It was proposed that OOSA should also invite developing countries to establish an entity at national or regional level to coordinate GNSS activities in order to promote GNSS applications through inter-institutional arrangements, building upon the efforts and investment made by various sectors of economy of the countries.

5 Meeting of the UN Action Team on GNSS

Parallel and intermingled with the above was work by the UN Action Team. It held two informal meetings, on 9 and 10 December, to discuss draft terms of reference of the International Committee on GNSS. Matt Higgins is a member of the Action Team, representing FIG.

The Action Team held its eighth plenary meeting on 11 December; presided over by the co-chairs, K. Hodgkins (United States) and M. Caporale (Italy). The meeting considered the following documents:

- a. Revised full report;
- b. Summary version of the report;
- c. Inputs for the report of the Committee on Peaceful of Outer Space (COPUOS) to go to the UN General Assembly for its UNISPACE III+5 review in 2004;
- d. Draft terms of reference of the International Committee on GNSS.

The Action Team agreed to include the following countries and organizations in its membership: Egypt, Nigeria, Romania, Zambia, International Association of Geodesy (IAG) and International Cartographic Association (ICA).

The Action Team agreed on the following action items:

- The full report will be revised and circulated to the members of the Action Team by early February.
- The co-chairs will revise the short version of the report on the basis of comments received during the meeting and submit it to the Scientific and Technical Subcommittee in time for its 41st session (16-27 February 2004).
- The co-chairs will prepare a clean copy of the draft terms of reference as amended by the Action Team and circulate it to all members.
- The first meeting of the International Committee on GNSS could be held on the margins of the next UN/USA International Workshop on GNSS, currently planned in December 2004 at Vienna.
- The Action Team will meet on the margin of the 41st session of the Scientific and Technical Subcommittee.

6 Additional Comments from the Workshop

In addition to the above report on the Workshop, Matt Higgins has the following specific comments from his perspective as FIG representative.

- a. The major outcome from the week was the proposal for the establishment of the International Committee on GNSS (ICG) under the auspices of the UN (through OOSA). It should be noted that there will now be discussions back in the jurisdictions of the major players (USA, Russia and EU) about issues associated with forming the ICG. It is likely that there will be some politics to follow but hopefully the concept of the ICG will be seen as valuable and it will come to fruition. For the first time in the more than 40 years history of GNSS, the ICG will allow organised, global input by civilians. The involvement of IGS, FIG, IAG and ICA, is a significant recognition of the importance of GNSS users in the Surveying, Mapping and Earth Sciences community. As a community, we need to take advantage of this opportunity.
- b. The report of the Action Team is very broad ranging and documents many GNSS applications, issues and coordination mechanisms across many countries. It also documents the current situation with the 3 GNSS systems and several augmentation systems. As such, the report will be a useful document for everyone interested in GNSS. The related presentations are also useful.
- c. It was gratifying to see the recognition by all Working Groups that geodetic reference frame is a significant infrastructure issue for all GNSS users.
- d. The UN deliberately involved people from developing countries in this process (including from many Surveying and Mapping organisations). This proved very beneficial in ensuring the recommendations really did address the needs of developing countries. Also, in working sessions, people from developing countries worked directly with office bearers in relevant international organisations, which was of benefit to both parties.
- e. Civilian input to GPS development can occur through the Civil GPS Interface Committee and that has an established mechanism for input by the Surveying and Mapping community. Since the Workshop in Vienna Matt Higgins has had email conversations with the Glonass and Galileo representatives about equivalent mechanisms for their systems. He thinks any coordination of input to the ICG from our community should also recognise these uni-lateral mechanisms.

Matt Higgins

Chair, FIG Commission 5

January 23, 2004