

## Report of Working Group C: Information Dissemination and Capacity Building

1. The Working Group C on Information Dissemination and Capacity Building (WGC) held its sixth meeting in Beijing, China, on 7 and 8 November 2012 in conjunction with the Seventh Meeting of the International Committee on Global Navigation Satellite Systems (ICG), 4 – 9 November 2012 under the chairmanship of the United Nations Office for Outer Space Affairs and China.
2. The meeting was attended by representatives of China, Japan, Malaysia, Russian Federation and United States of America. The representatives of Civil GPS Service Interface Committee (CGSIC) and the United Nations-affiliated Regional Centre for Space Science and Technology Education – in French language (CRASTE-LF) also participated in the meeting.
3. The Working Group in the course of its deliberations in 2011 in the Sixth Meeting of the ICG, Tokyo, Japan reviewed progress made in the implementation of and follow-up to its recommendations and the activities carried out by the Office for Outer Space Affairs in the framework of its Programme on GNSS Applications.
4. After brief introductory remarks focused on the expectations of the meeting, the co-chairs invited the presentations. Details of the meeting agenda and the presentations made are available at the ICG Information Portal (see <http://www.unoosa.org/oosa/en/SAP/gnss/icg/icg07/wgc.html>)
5. The Working Group heard the following presentations:
  - i) “Update on education and training activities on GNSs in China, and views on ICG information centre”, by Mr. Jingnong Weng, China;
  - ii) “Introduction to international space weather initiative (ISWI) and China's participation (Meridian Project)”, by Mr. Chi Wang, China;
  - iii) “Multi-GNSS Asia demonstration campaign: The framework of multi-GNSS Asia”, Mr. Akio Yasuda, Japan;
  - iv) “Soil moisture content detection based on GNSS-R”, Dongkai Yang, China;
  - v) “Proposed role of Russian education centre in constituted world of GNSS centres network”, by Mr. Pavel Kazakov, Russian Federation;
  - vi) “Standardization of position information during catastrophic incident Search and Rescue (SAR) event”, by Mr. Rick Hamilton, CGSIC;
  - vii) “GNSS/GLONASS special applications and the programs of practical training specialists”, by Mr. Andrey Kupriyanov, Russian Federation;
  - viii) “Activities of CRASTE-LF on capacity building in space science and technology: Launch of postgraduate training in GNSS”, by Mr. Abderrahmane Touzani, CRASTE-LF (Morocco);
  - ix) “ICG Website”, by Ms. Stephanie WAN, United States of America.
6. At the conclusion of the presentations from Working Group members, the Working Group discussed the following proposals prepared by the members of the Working Group:
  - (a) ICG Website redesign (prepared by the representative of the United States of America);

- (b) International Centre for GNSS Science, Technology and Education at Beihang University of China to act as ICG Information Centre (prepared by the representative of China);
- (c) Amend the WGC workplan to reflect responsibility for information dissemination activities (prepared by the representative of CGSIC);
- (d) Participation to Navipedia (prepared by the representative of the European Space Agency).

#### **A. ICG Website redesign**

7. The Working Group noted that in response to the ICG Executive Secretariat request for input, the United States gave a presentation on ICG website revision at the Sixth Meeting of ICG in 2011, in Tokyo. The United States again made the presentation on ICG website revision, and China presented GNSS information service system at the Ninth Meeting of the Providers' Forum.
8. The Working Group took note that the current ICG website is hosted and maintained by the Office for Outer Space Affairs. It was also noted that the specific elements and features desired of the ICG website needed to be identified by the ICG and its Providers' Forum and documented.
9. The Working Group agreed that the implementation of ICG website revision might be possible through various mechanisms such as:
  - The Office for Outer Space Affairs revises and continues the hosting of the current ICG website;
  - The Office revises, and continues the hosting of the current ICG website to the degree possible. Meanwhile, links to external website (s) is to be added to the ICG website. The external website (s) would provide the desired ICG website elements and features to enrich a user's experience;
  - An ICG member accepts the responsibility of hosting the ICG website including the maintenance and revision.
10. The Working Group agreed that the WGC workplan is being modified to incorporate the following new action "ICG Website":

*Document the desired elements and features of the ICG Website as provided by the ICG and its Providers' Forum members. Produce a report that is sufficiently detailed for the purpose of being used by a website designer to revise the ICG Website.*

*Document the proposals for the revision and hosting of the ICG Website. Produce a recommendation detailing which of the options provided is considered to be the most suitable for adoption by the ICG.*

#### **B. Proposal on the International Centre for GNSS Science, Technology and Education at Beihang University, China to act as ICG Information Centre**

11. The Working Group noted that the United Nations International Meeting on the Applications of GNSS held on 12 – 16 December 2011 in Vienna (see A/AC.105/1019) recommended that the United Nations should lead an international effort to establish an International Centre for GNSS Science, Technology and Education in an existing national educational and research institution. It was also noted that Beihang University (<http://www.buaa.edu.cn>), Beijing, China offered to host such a centre.
12. The Working Group noted that the Beidou International Communication and Training Centre was inaugurated on 24 August 2012 and the following courses were organized by Beihang University in 2012:
  - Summer School on GNSS frontier technology; and

- Master's degree programme on GNSS.

13. The Working Group took note of a proposal for a GNSS Information Service System for education and research purposes. It was noted that Beihang University established a partnership with Asia Pacific Space Cooperation Organization (APSCO), and Beihang University is currently pursuing the cooperation with the UN-affiliated Regional Centres for Space Science and Technology Education.
14. The Working Group recommended to recognize International Centre for GNSS Science, Technology and Education as an ICG Information Centre.

### **C. Information dissemination activities**

15. The Working Group noted the United States' proposal to add a new topic heading "Information Dissemination" and an action item numbered C6 to the ICG Working Group C Workplan. It was noted that:

- The Working Group had responsibility for information sharing and dissemination;
- The challenge for GNSS systems was developing methods to quickly and efficiently distribute available system information;
- In a future multi-GNSS world, methods to distribute this information would have to be coordinated among provider systems to facilitate common use by users;
- The ICG members were particularly suited to identifying ways to distribute information, including the development of web-presence materials to document, and publicize the related activities.

16. The Working Group recommended to add topic heading "Information Dissemination" and the associated action item to the Workplan of the Working Group:

*Action C6: Information Dissemination Identify recommended methods to quickly and efficiently distribute information available from GNSS systems to the public, governmental, scientific and commercial users of GNSS, including web-presence materials to document, and publicize the related activities.*

### **D. Participation to Navipedia**

17. The Working Group noted that the current GNSS international scenario is very dynamic, including the modernization of the legacy GNS and GLONASS as well as the emergence of new satellite navigation systems, including Galileo in Europe and Beidou in China, but also Satellite-based Augmentation and Regional satellite systems such as QZSS in Japan, and GAGAN in India.
18. It was noted highlighted that the field of satellite navigation is progressing at such a rapid pace that it is difficult to keep track of the latest evolutions, satellite launches, technologies or even systems and signals. Furthermore, books on GNSS are rapidly outdated and incorrect information could be found scattered over the internet.
19. The Working Group noted that in order to overcome such issues the European Space Agency (ESA) launched Navipedia aiming at having a GNSS educational portal (or wiki) to support the transfer of GNSS know-how to the public, providing a common, complete and trustable compilation of reference updated knowledge on GNSS.
20. It was noted that Navipedia was freely accessible on the internet via [www.navipedia.org](http://www.navipedia.org) and it was conceived as a collaborative GNSS encyclopedia with the objective to foster the transfer of knowledge on GNSS. Navipedia adopted the concept of Media-wiki products where anyone could comment, propose modification to an existing articles, suggest a new topic or submit a draft article.

21. The Working Group recommended to invite all ICG participants to contribute to Navipedia and support therewith education in the area of navigation.
22. The Working Group noted that the Russian Education Centre lead by the Russian Space System JSC was developing GLONASS/GNSS education infrastructure, including distance learning education courses and programmes. The work of the Moscow State University on Geodesy and Cartography (MIIGAİK) was highlighted. It was noted that these courses provided through a distance-learning degree programme could be a good resource for effectively teaching diverse learners of all disciplines at the United Nations- affiliated Regional Centres for Space Science and Technology Education.
23. The Working Group also noted that the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS), at its forty-ninth session, noted the conclusion of the item entitled “International Space Weather Initiative” and agreed that an item entitled “Space weather” should be introduced as a regular item on the agenda of the Subcommittee, in order to allow member States of COPUOS and international organizations having permanent observer status with the Committee to exchange views on national, regional and international activities related to space weather research with a view to promoting greater international cooperation in that area.
24. The Working Group, therefore, agreed to change the Workplan Action C4 heading into “Space Weather” to reflect progress and development in the space weather effects on GNSS, including ionospheric modelling as an effective approach for correcting the ionospheric range error and improving the GNSS positioning accuracy

## ATTACHMENT 1

### **Revised Workplan Working Group C – Information Dissemination and Capacity Building (Lead: United Nations Office for Outer Space Affairs)**

#### **Introduction**

Efforts to build capacity in space science and global navigation satellite systems (GNSS) technology are considered a major focus of the Office for Outer Space Affairs and are of specific interest to ICG. Such efforts should aim to provide support to the regional centres for space science and technology education affiliated to the United Nations, which would also act as ICG information centres, to foster a more structured approach to information exchange in order to fulfil the mutual expectations of a network linking ICG and the regional centres; and to connect the institutions involved or interested in GNSS applications with GNSS system providers. The regional centres for Africa are located in Morocco and Nigeria; for Latin America and the Caribbean, in Brazil and Mexico; and for Asia and the Pacific, in India. Therefore, the Office for Outer Space Affairs will lead the working group and ensure that the work is carried out, milestones are reached and deliverables are met. As work of the working group proceeds, additional UN entities, institutions or organizations may join, thus ensuring wider participation. The workplan consists of 4 actions and it consolidates ICG activities implemented as part of the workplan approved at the first meeting of ICG in 2006 (A/AC.105/879, annex 1, ICG/WP/NOV2006).

#### **Training for Capacity Building in Developing Countries**

**Action C1:** Establish and support education and training programmes related to satellite navigation and location-based services for purposes of building capacity in developing countries through the regional centres for space science and technology education affiliated to the United Nations and other centres of excellence. This will consolidate the regional centres as ICG information centres and lead to the development of a GNSS education curriculum. In addition, update and maintain the ICG information portal's education-focused page to incorporate e-learning based mode of knowledge transfer and a list of relevant textbooks on GNSS in English and other languages.

**Action C2:** Build upon the existing educational programmes and support the creation of new under and post graduates programmes in both developing and developed countries, including distance learning programmes, web-based courses and tutorials, interactive programmes for middle/high schools, multimedia softwares and demonstration data sets to enrich the training and research programmes. Further consideration should be given to onsite "hands-on/off" training programmes. Support the establishment of International Centres for GNSS Science, Technology Development and Education based on the existing national educational and research institutions.

#### **Promoting the Use of GNSS Technologies as Tools for Scientific Applications**

**Action C3:** Promote the use of GNSS technologies as tools for scientific applications in developing countries, with emphasis on Africa. This action will lead to the development and implementation of a training programme for the end users in various disciplines, such as geodesy, geophysics, space weather and meteorology, and to provide a forum for exchanges among scientists and organizers of networks of instruments.

### **Space Weather (re-named)**

**Action C4:** Build upon the International Space Weather Initiative (ISWI) and support the establishment of ground-based world-wide instrument arrays for exploring atmospheric phenomena related to space weather and climate change. The initiative is to address all aspects of the response of the mid- and low-latitude ionosphere to magnetic storms and space weather effects of such storms, including *in situ* and ground-based observations as well as modeling and theoretical studies.

### **Regional Workshops on Applications of GNSS**

**Action C5:** Organize a series of workshops focusing on capacity-building in the use of GNSS in various areas of applications that support sustainable development, in particular in developing countries.

### **Information Dissemination (new)**

**Action C6 (new):** Identify recommended methods to quickly and efficiently distribute information available from GNSS systems to the public, governmental, scientific and commercial users of GNSS, including web-presence materials to document, and publicize the related activities.

### **ICG Website (new)**

**Action C7:** Document the desired elements and features of the ICG Website as provided by the ICG and its Providers' Forum members. Produce a report that is sufficiently detailed for the purpose of being used by a website designer to revise the ICG Website.

**Action C8:** Document the proposals for the revision and hosting of the ICG Website. Produce a recommendation detailing which of the options provided is considered to be the most suitable for adoption by the ICG.

**ATTACHMENT 2****WG-C Recommendation 1 for Committee Decision****Prepared by:** Working Group C**Date of Submission:** 08 November 2012**Issue Title:** ICG Website**Background/Brief Description of the Issue:**

The current ICG Website is maintained by UNOOSA. At the 6th meeting of ICG, responding to the ICG secretariat request for input, USA gave a presentation on ICG website revision. At the 7th meeting of ICG, USA again gave the presentation on ICG website revision, and China made the presentation on ICG information service system to the Providers' Forum. The Providers' Forum referred both of the presentations to WG-C for further consideration. WG-C considered the topic of possible revision of the ICG Website and the two presentations referred to it by the Providers' Forum.

**Discussion/Analyses:**

Discussion of the issue led the group to agree on the following two points:

1. The specific elements and features desired of the ICG Website need to be identified by the ICG/PF and documented.
2. The implementation of ICG Website revision may be possible through various mechanisms, some examples of which are: (NOTE: other mechanisms are possible)
  - a. UNOOSA revises and continues the hosting of the current ICG Website
  - b. UNOOSA revises, and continues the hosting of, the current ICG Website to the degree possible. Links to external website(s) will be added to the ICG Website. The external website(s) would provide the desired ICG Website elements and features that could not be provided by UNOOSA.
  - c. An ICG Member accepts the responsibility of hosting the ICG Website including the maintenance and revision.

Also, the group agreed to prepare a Recommendation for Committee Decision providing the proposed Workplan modification for addressing the issue of revising the content and format of the ICG Website.

**Recommendation of Committee Action:**

1. The ICG invites its participants to review the ICG Website and provide, to the next meeting(s) of WG-C, specific details on how the content and format should be revised.
2. The ICG invites its participants and the ICG Executive Secretariat to consider and provide proposals for the revision and hosting of the ICG Website.
3. The WG-C Workplan is to be modified to incorporate the following new action:

**ICG Website**

- Document the desired elements and features of the ICG Website as provided by ICG/PF participants. Produce a Report that is sufficiently detailed for the purpose of being used by a website designer to revise the ICG Website.
- Document the proposals for the revision and hosting of the ICG Website. Produce a Recommendation for Committee Decision detailing which of the options provided is considered to be the most suitable for adoption by the ICG.



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## WG-C Recommendation 2 for Committee Decision

**Prepared by:** Working Group C (Proposed by the representative of China)

**Date of Submission:** 08 November 2012

**Issue Title:** Proposal on the International Centre for GNSS Science, Technology and Education at Beihang University, as ICG Information Centre

### Background/Brief Description of the Issue:

The United Nations International Meeting on the Applications of GNSS held on 12-16 December 2011 in Vienna (A/AC.105/1019) recommended that the United Nations should lead, with the active support of China and relevant scientific organizations, an international effort to establish an International Centre for GNSS Science, Technology and Education in an existing national educational and research institution. Beihang University (<http://www.buaa.edu.cn>), Beijing, China, has offered to host such a centre.

### Discussion/Analyses:

In the past year, Beihang University actively started the construction of the center. With the support of China Satellite Navigation Office and the university, the Beidou international communication and training center was inaugurated on August 24, 2012. Summer school on GNSS frontier technology was held, and the Master degree program on GNSS has begun with 20 participants from 7 countries. Beihang University has established a partnership with Asia Pacific Space Cooperation Organization (APSCO) and is pursuing the cooperation with the UN-affiliated Regional Centers for Space Science and Technology Education located in Morocco, Nigeria, India, Mexico/Brazil and Jordan. A GNSS Information Service System for education and research purposes is proposed.

### Recommendation of Committee Action:

Recognize International Centre for GNSS Science, Technology and Education as an ICG information centre.

## **WG-C Recommendation 3 for Committee Decision**

**Prepared by:** Working Group C (Proposed by the representative of USA)

**Date of Submission:** 08 November 2012

**Issue Title:** Amend the WGC workplan to reflect responsibility for information dissemination activities

### **Background/Brief Description of the Issue:**

The U.S. proposes that the ICG consider adding a new topic heading “Information Dissemination” and an action item numbered C6 under “Information Dissemination” to the ICG Working Group-C (WG-C) Workplan. Currently, the Workplan does not contain either of these.

### **Discussion/Analyses:**

WG-C has responsibility for information sharing and dissemination. The workplan for WG-C currently does not contain wording to explain that portion of the working group’s designation. An integral part of, and challenge for GNSS systems is developing methods to quickly and efficiently distribute available system information to public, governmental, scientific, and commercial users of GNSS. In a future multi-GNSS world, methods to distribute this information will have to be coordinated among provider systems to facilitate common use by users. The ICG members, from governmental, scientific and educational backgrounds, are particularly suited to identifying ways to distribute information, including the development of web-presence materials to document and publicize the related activities.

### **Recommendation of Committee Action:**

The recommendation of ICG WG-C is to add topic heading “Information Dissemination” and the associated action item to the WG-C Workplan as follows:

#### **Information Dissemination**

Action C6 (new): Identify recommended methods to quickly and efficiently distribute information available from GNSS systems to the public, governmental, scientific, and commercial users of GNSS, including web-presence materials to document and publicize the related activities.

## **Recommendation 4 for Committee Decision**

**Prepared by:** Working Group C (proposed by the representative of European Space Agency)

**Date of Submission:** 08 November 2012

**Issue Title:** Participation to Navipedia

### **Background/Brief Description of the Issue:**

The current GNSS international scenario is very dynamic, including the modernization of the legacy GPS and GLONASS as well as the emergence of new satellite navigation systems including Galileo in Europe and COMPASS in China, but also Satellite Based Augmentation and Regional satellite systems. The field of satellite navigation is progressing at such a rapid pace that it is difficult to keep track of the latest evolutions, satellite launches, technologies or even systems and signals. Furthermore, books on GNSS are rapidly outdated and incorrect information can be found scattered over the internet.

### **Discussion/Analyses:**

In order to overcome the issues listed above the European Space Agency has launched Navipedia aiming at having a GNSS educational portal (or wiki) to support the transfer of GNSS know-how to the public, providing a common, complete and trustable compilation of reference updated knowledge in GNSS. Navipedia is freely accessible on the internet via [www.navipedia.org](http://www.navipedia.org) and is conceived as a collaborative GNSS encyclopedia with the objective to foster the transfer of knowledge in the field of GNSS. Navipeia adopts the concept of Media-wiki products where anyone can comment, propose modification to an existing articles, suggest a new topic or submit a draft article.

### **Recommendation of Committee Action:**

ICG WG-C invites all ICG participants to contribute to Navipedia and support therewith education in the area of navigation.