

Report of Working Group C: Information Dissemination and Capacity Building

1. The Working Group C on Information Dissemination and Capacity Building (WGC) held its ninth meeting in Boulder, Colorado, United States of America, on 3 and 4 November 2015 in conjunction with the tenth meeting of the International Committee on Global Navigation Satellite Systems (ICG), 2 – 6 November 2015 under the chairmanship of the United Nations Office for Outer Space Affairs and the United States.
2. The meeting was attended by representatives of China, Japan, Malaysia, Russian Federation, United States of America and the European Commission. The representatives of Civil Global Positioning System (GPS) Service Interface Committee (CGSIC), the African Regional Centre for Space Science and Technology Education – in French Language (CRASTE-LF), the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean (CRECTEALC), the Regional Centre for Space Science and Technology Education in Asia and the Pacific (RCSSTEAP-China) and the Space Generation Advisory Council (SGAC) also participated in the meeting.
3. The Working Group, in the course of its deliberations, 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 Global Navigation Satellite Systems (GNSS) Applications.
4. The Working Group noted that the Programme for 2015 had been carried out satisfactorily.
5. 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 at:
<http://www.unoosa.org/oosa/en/ourwork/icg/working-groups/c.html>
6. The following presentations were made and discussed:
 - (a) Status report on the BeiDou international exchange and training centre, by J. Weng of Beihang University, China;
 - (b) Activities of the centre in GNSS postgraduate training courses, and space science and technology, by A. Touzani of CRASTE-LF, Morocco;
 - (c) Training experience of highly qualified specialists in GLONASS/GNSS applications, and cooperation of industry with leading universities, by A. Kupriyanov, V. Malinnikov and P. Kazakov of the Russian Federation;
 - (d) European GNSS Service Centre (GSC) – US Coast Guard Navigation Centre (NAVCEN) Cooperation, by A. Alvares-Rodriguez, of the European GNSS Agency (GSA), Czech Republic and R. Hamilton of CGSIC, United States;
 - (e) GNSS for Practical Applications, Science, Capacity Building, and Training, by P. Doherty of the United States (presented by T. Fuller-Rowell of the University of Colorado, United States);

- (f) United Nations/Russian Federation Workshop on the applications of GNSS by V. Kosenko, V. Zvonar and M. Molokanova of the joint stock company Academician M. F. Reshetnev Information Satellite Systems (JSC ISS), Russian Federation.
7. At the conclusion of the presentations, the Working Group reviewed past recommendations and defined three priority areas as a general framework for organizing its work:
 - (1) Capacity Building and GNSS outreach activities in South-East Asia: *The Working Group agreed that activities begun in 2014, including capacity-building, education and outreach activities should be continued and expanded;*
 - (2) Outreach material and contribution to the United Nations-affiliated regional centres for science and technology acting as information centres for the ICG: *The Working Group agreed that all ICG members were encouraged to disseminate the educational materials, brochures/publications through the regional centres and relevant e-mail lists among GNSS user groups in the regions;*
 - (3) Template for cooperation between existing or developing providers and GNSS user information centres: *The Working Group noted that the template for each GNSS provider with links and contact information for all user information centres had been developed and would be posted on the ICG information portal.*
 8. The Working Group discussed the United States' proposal to elaborate on various studies on the economic benefits of utilizing GNSS, and agreed to prepare a paper "Inclusion of GNSS Economic Benefits in information for dissemination purposes" about the economic benefits of GNSS in its information for dissemination to current and future GNSS users.
 9. In order to better reflect its scope of work, the Working Group considered the possibility of changing the Working Group's title and proposed the following title "Global Navigation Satellite Systems (GNSS) Capacity Building, Education and Outreach (GCBE0)" to be discussed at next meeting.
 10. The recommendations, which emanated from the deliberations of the Working Group, are listed in Attachment 1 of this report.

ATTACHMENT 1**Recommendation 1 for Committee Decision**

Prepared by: Working Group C

Date of Submission: 05 November 2015

Issue Title: **Proposed template for cooperation between existing and developing Provider and GNSS user information centers**

Background/Brief Description of the Issue:

A proposed template for cooperation between GNSS service centers had been presented to the Working Group. Webpages with Provider links have been developed and will be posted on the ICG Information Portal and offered to Providers for posting on their web-sites once it completed.

Discussion/Analyses:

The ability to quickly answer user inquiries was critical to instilling confidence in the GNSS being used. Problems encountered with equipment and disruption reports needed to be quickly referred to subject matter experts and law enforcement authorities for disposition. A template had been developed that attempts to identify the manner in which certain types of questions can be forwarded back and forth between service centers to the benefit of the user, and establish the existing or developing center as the representative for their GNSS.

Recommendation for Committee Action:

The Providers and GNSS user information centres should continue developing and adopting a process for referring inquiries to each other where appropriate.

Recommendation 2 for Committee Decision

Prepared by: Working Group C

Date of Submission: 05 November 2015

Issue Title: **Increase ICG Member Cooperation and Support in GNSS Education**

Background/Brief Description of the Issue:

This recommendation was based on China's presentation on updated GNSS educational activities at Beihang University.

Discussion/Analyses:

Enhanced access by developing countries to training and educational resources was needed in order to build their capacity in the use of GNSS technologies. Develop and distribute educational booklets covering fundamentals of GNSS that could serve as educational resources for the United Nations-affiliated Regional Centres for Space Science and Technology Education and other institutions in all regions.

In this regard, the work of Beihang University of China and the Moscow State University of Geodesy and Cartography (MIIGAİK) of the Russian Federation was highlighted.

It was also noted that an international exchange program was an enriching experience on many levels. It affected both personal and professional development, stimulated creative ideas, and enhanced relationships among the institutions at the national, regional and international levels. Faculty and staff alike would experience first-hand different approaches to education, teaching styles, and research. Therefore, working, teaching or conducting research in different environments presents new and rewarding challenges, in particular for the United Nations-affiliated Regional Centres for Space Science and Technology Education.

Recommendation for Committee Action:

In order to support rising demands in the use of space technology, in particular in developing countries, increased cooperation was needed in GNSS knowledge sharing (e.g. textbooks/teaching materials, faculty/students exchange programmes) among ICG members and the United Nations-affiliated Regional Centres for Space Science and Technology Education and other centers of excellence and institutions, such as Beihang University and Moscow State University of Geodesy and Cartography (MIIGAİK).

Recommendation 3 for Committee Decision

Prepared by: Working Group C

Date of Submission: 05 November 2015

Issue Title: **Expand Capacity Building and GNSS outreach activities**

Background/Brief Description of the Issue:

In reference to the recommendation “Capacity Building and GNSS outreach activities in South-East Asia” (ICG-9, Prague, Czech Republic) to expand the action.

Discussion/Analyses:

It was highlighted that the work of the Moscow State University on Geodesy and Cartography (MIIGAİK) was developing GLONASS/GNSS education courses, including distance learning education programmes. Therefore, these courses, provided through a distance-learning degree programme, could be a good resource for effectively teaching diverse levels of trainees of all disciplines at the United Nations-affiliated Regional Centres for Space Science and Technology Education.

Recommendation for Committee Action:

The Office for Outer Space Affairs, in cooperation with the ICG members and the United Nations-affiliated Regional Centres for Space Science and Technology Education and other centers of excellence and institutions, should organize workshops/technical seminars in the field of GNSS and its applications in all regions.

It was noted that courses prepared by the Moscow State University on Geodesy and Cartography (MIIGAİK) could be provided through a distance-learning degree programme to the United Nations-affiliated Regional Centres for Space Science and Technology Education. In addition, a faculty/student exchange programme could be established with MIIGAİK of the Russian Federation and Beihang University of China.

Recommendation 4 for Committee Decision

Prepared by: Working Group C

Date of Submission: 05 November 2015

Issue Title: **Consideration of the value of National Positioning Navigation and Timing (PNT) Advisory Committees**

Background/Brief Description of the Issue:

This recommendation was based on the United States proposal by Dr. Brad Parkinson in the ICG-9 meeting, 2014, Prague, Czech Republic and briefing made by the United States representative in the Working Group C.

Discussion/Analyses:

Space-based positioning, navigation and timing (PNT) capabilities are truly a global utility that positively affect the daily lives of many people around the globe.

The U.S. National Space-Based Positioning, Navigation, and Timing (PNT) Advisory Board provides independent advice to the U.S. government on GPS-related policy, planning, program management, and funding profiles in relation to the current state of national and international satellite navigation services. The PNT Advisory Board provides advice, as directed by the U.S. government's PNT Executive Committee (EXCOM), on U.S. PNT policy, planning, program management, and funding profiles in relation to the current state of national and international space-based PNT services. This advice consists of assessments and recommendations to facilitate the accomplishment of the goals and objectives of the U.S. PNT Policy on behalf of the PNT EXCOM. The PNT Advisory Board evaluates national and international needs for changes in space-based PNT capabilities, assesses possible trade-offs among options, and provides independent advice and recommendations on requirements and program needs. These evaluations are considered in recommending a national PNT strategy and in development of annual updates to a U.S. PNT Policy 5-Year Plan. Board members are selected subject-matter experts within a variety of GPS user communities.

Recommendation for Committee Action:

It is proposed that ICG member countries consider the value of National and Regional PNT Advisory Committees and share their findings at ICG meetings when available