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Committee on the Peaceful Uses of Outer Space

Fourth Meeting of the International Committee on Global Navigation Satellite Systems

Note by the Secretariat

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I. Introduction

A. Background

1. The Committee on the Peaceful Uses of Outer Space, at its fifty-second session, in 2009, noted with appreciation that the International Committee on Global Navigation Satellite Systems (ICG) continued to make significant progress towards achieving compatibility and interoperability among global and regional space-based positioning, navigation and timing systems and in promoting the use of global navigation satellite systems (GNSS) and their integration into national infrastructures, particularly in developing countries.¹

2. In order to help developing countries and countries with economies in transition to participate in and benefit from GNSS activities being carried out by the Office for Outer Space Affairs of the Secretariat and in implementation of the activities of the programme on GNSS applications for 2009, the Office for Outer Space Affairs, jointly with the United States of America and the European Space Agency (ESA), organized the United Nations/Azerbaijan/United States of America/European Space Agency Workshop on applications of GNSS for the benefit of countries, held in Baku on 11-15 May 2009 (A/AC.105/946).

3. In accordance with the ICG workplan, the Office for Outer Space Affairs, serving as the executive secretariat of ICG and the Providers' Forum, co-organized international training courses on satellite navigation and location-based services for the purpose of building capacity in developing countries through the regional centres for space science and technology education, affiliated to the United Nations, which would also act as ICG information centres (A/AC.105/951). The ICG information centres would foster a more structured approach to information exchange through a network linking ICG and the regional centres and would connect the institutions involved or interested in GNSS applications with providers of GNSS systems. The training courses were co-sponsored by the Government of the United States through ICG.

4. Since 2005, the Office for Outer Space Affairs, consistent with its role as the executive secretariat of ICG and its Providers' Forum, has served as the focal point for matters relating to organization of the annual meetings of ICG, interim planning and working group activities.

5. The Office for Outer Space Affairs organized and hosted the First Meeting of ICG in Vienna on 1 and 2 November 2006 (A/AC.105/879). The Second Meeting of ICG was held in Bangalore, India, from 4 to 7 September 2007 (A/AC.105/901). The Third Meeting of ICG was held in Pasadena, California, United States, from 8 to 12 December 2008 (A/AC.105/928).

6. The Fourth Meeting of ICG was held in Saint Petersburg, Russian Federation, from 14 to 18 September 2009 under the chairmanship of the Russian Federation.

¹ *Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20)*, para. 128.

B. Structure and programme of the Meeting

7. The programme of the Fourth Meeting of ICG included three plenary sessions and working group meetings.² At the first plenary session of the Meeting, held on 14 September 2009, GNSS service providers and augmentation system providers made presentations on the status of their systems and future plans. The presentations made by associate members and observers outlined recent developments with regard to GNSS services, applications, and educational and capacity-building activities at the global, regional and national levels. Representatives of industrial entities and academic institutions also made presentations on GNSS science and innovative technology applications, outlining opportunities in user applications and GNSS technology for consideration by ICG and its working groups.

8. At its plenary sessions held on 17 and 18 September 2009, ICG considered the implementation of the recommendations of the working groups and plans to address the current and future work of each working group. GNSS exhibitions at the meeting venue included displays by manufacturers of their current range of products in the field of equipment, services and applications for positioning, navigation and timing.

9. In accordance with the workplan of ICG, four working group meetings, held on 16 and 17 September 2009, focused on the following issues: compatibility and interoperability (led by the Russian Federation and the United States); enhancement of performance of GNSS services (led by ESA); information dissemination and capacity-building (led by the Office for Outer Space Affairs); and interaction with national and regional authorities and relevant international organizations (led by the International Federation of Surveyors, the International Association of Geodesy and the International GNSS Service).

10. After considering the various items before it, ICG adopted the joint statement summarized in section III below.

11. In conjunction with the Fourth Meeting of ICG the Providers' Forum held its fourth meeting in Saint Petersburg, Russian Federation, on 13, 15, 16 and 17 September 2009 under the chairmanship of the Russian Federation and the United States (see section IV below).

C. Attendance

12. Representatives of the following States participated in the Fourth Meeting: China, Italy, Japan, Russian Federation and United States. Representatives of the European Community and ESA also participated.

13. The following intergovernmental and non-governmental organizations dealing with GNSS services and applications were represented at the Meeting: Civil Global Positioning System Service Interface Committee, European Position Determination System, International Association of Geodesy (IAG) and IAG Reference Frame Sub-Commission for Europe, International Earth Rotation and Reference Systems

² A list of entities participating in ICG is contained in annex I.

Service, International Federation of Surveyors, International GNSS Service and Office for Outer Space Affairs.

14. The Meeting was attended by observers for the following organizations: International Bureau of Weights and Measures (BIPM) and International Association of Institutes of Navigation.

15. ICG invited the International Civil Aviation Organization, the regional centres for space science and technology education, affiliated to the United Nations, and the Space Generation Advisory Council, upon their request, to attend the meeting and to address it, as appropriate.

16. A list of States Members of the United Nations and governmental, intergovernmental and non-governmental organizations participating in ICG is contained in annex I.

D. Documentation

17. A list of the documents of the Fourth Meeting is contained in annex II. The documents and further information on the Meeting programme and presentations are available on the ICG information portal (www.icgsecretariat.org).

II. Recommendations and decisions

18. The chairman of the Fourth Meeting outlined the work that ICG had before it at the Fourth Meeting and reviewed related events held in conjunction with that Meeting.

19. The co-chairman of the Providers' Forum made a statement on the results of the Providers' Forum. It was noted that the Providers' Forum continued to make significant progress towards further elaboration and implementation of measures for compatibility and interoperability among global and regional space-based positioning, navigation and timing systems. It was also noted that further consideration had been given to disseminating information on open service signal specifications and service standards.

20. ICG noted with satisfaction the work done by the working groups in implementation of the actions contained in the ICG workplan.

21. ICG endorsed the recommendation that, consistent with the principle of transparency, every GNSS provider should publish documentation containing signal and system information, the policies of provision and the minimum levels of performance offered by its open service.

22. ICG expressed its appreciation to the Office for Outer Space Affairs for work undertaken in support of ICG and its Providers' Forum, including carrying out the activities planned for 2009 and maintaining the ICG information portal.

23. ICG noted with appreciation that regional centres for space science and technology education, affiliated to the United Nations, would serve as ICG information centres.

24. ICG agreed to invite the Space Generation Advisory Council to participate in an expert capacity in the work of ICG Working Group C on information dissemination and capacity-building.

III. Joint statement

25. ICG adopted by consensus the following joint statement:

1. The Fourth Meeting of the International Committee on Global Navigation Satellite Systems (ICG) was held in Saint Petersburg, Russian Federation, from 14 to 18 September 2009, to continue reviewing and discussing developments in global navigation satellite systems (GNSS) and to allow ICG members, associate members and observers to consider matters of interest. ICG also addressed GNSS science and innovative technology applications and future commercial applications. Representatives from industry, academia and Governments shared views on GNSS compatibility and interoperability.

2. The Meeting was hosted by the Government of the Russian Federation. Participants in the Meeting included China, Italy, Japan, the Russian Federation, the United States of America, the European Community and the European Space Agency (ESA), as well as the following international organizations: Civil Global Positioning System Service Interface Committee, European Position Determination System, International Association of Geodesy (IAG) and IAG Reference Frame Sub-Commission for Europe, the International Bureau of Weights and Measures (BIPM), the International Federation of Surveyors, International Earth Rotation and Reference Systems Service, International Association of Institutes of Navigation, International GNSS Service, and the Office for Outer Space Affairs of the United Nations Secretariat. The representatives of the International Civil Aviation Organization, the regional centres for space science and technology education, affiliated to the United Nations, located in Mexico and Brazil, Morocco and Nigeria and the Space Generation Advisory Council attended the meeting.

3. ICG recalled that the General Assembly, in its resolution 63/90 of 5 December 2008, had noted with appreciation that ICG had been established on a voluntary basis as a forum to promote cooperation, as appropriate, on matters of mutual interest to its members related to civil satellite-based positioning, navigation, timing and value-added services, as well as the compatibility and interoperability of global navigation satellite systems and to promote their use to support sustainable development, particularly in developing countries.

4. ICG noted that the working groups focused on the following issues: compatibility and interoperability; enhancement of the performance of GNSS services; information dissemination and capacity-building; and interaction with national and regional authorities and relevant international organizations. It also noted that substantive progress had been made in furthering the workplans of ICG and the Providers' Forum that had been approved at the previous meetings of ICG.

5. ICG noted that Working Group A on compatibility and interoperability had organized two workshops in 2009 to explore further the issue of GNSS interoperability from users' perspectives before resuming its deliberations at the Fourth Meeting of ICG. At the Fourth Meeting of ICG, Working Group A made some amendments to its workplan, in particular, regarding further elaboration and implementation of the principle of compatibility, consistent with International Telecommunication Union regulations and recommendations, and proposed a new principle of transparency. Working Group A plans to hold, at a minimum, an additional interoperability workshop in 2009 and a compatibility workshop in 2010.
6. Working Group B on enhancement of the performance of GNSS services discussed techniques for enhancement of GNSS services and the opportunity to monitor the ionosphere during the next solar maximum and its effects on GNSS receivers.
7. Working Group C on information dissemination and capacity-building continued to develop a programme on GNSS applications and emphasized the participation of ICG in the International Space Weather Initiative.
8. The task forces of Working Group D on interactions with national and regional authorities and relevant international organizations began their work to develop processes to align and maintain geodetic and timing references, which are fundamental to the interoperability of GNSS. It was also agreed to hold additional workshops between the annual ICG meetings.
9. ICG and the Providers' Forum discussed the revision of their workplans. During a plenary session, ICG also decided to support a proposal for a multi-GNSS demonstration project in the Asia/Oceania region.
10. ICG accepted the invitation of Italy and the European Community to jointly host its Fifth Meeting in Turin, Italy, from 18 to 22 October 2010. The Office for Outer Space Affairs, as the executive secretariat of ICG and the Providers' Forum, will assist in the preparations for those meetings and for interim planning and working group activities. ICG noted the expression of interest by Japan to host the Sixth Meeting of ICG in 2011 and by China to host the Seventh Meeting of ICG in 2012.

IV. Providers' Forum

26. The fourth meeting of the Providers' Forum, co-chaired by the Russian Federation and the United States, was held in conjunction with the Fourth Meeting of ICG in Saint Petersburg, Russian Federation. The meeting consisted of four sessions, on 13, 15, 16 and 17 September 2009. China, Japan, the Russian Federation and the United States, as well as the European Community, were represented at the meeting.

27. After consideration of the item on its agenda, the Providers' Forum adopted the report on the meeting containing the recommendations and decisions set out below.

A. Summary of discussions and recommendations

1. Promotion of compatibility and interoperability

Review of principles on compatibility and interoperability

1. The representative of the European Community presented its position on compatibility and interoperability and proposed two objectives to be included in the official documentation of the Providers' Forum: "Global and regional system providers agree that, at a minimum, all global navigation satellite systems (GNSS) signals must be compatible. To the maximum extent possible, open signals and services should also be interoperable". The European Community also proposed two options to deal with compatibility. Views of other providers were presented, and it was noted that those views would be further elaborated in the related meetings of the Providers' Forum leading up to the Fifth Meeting of ICG, to be held in Italy in 2010.

Status of consolidated report on planned and operating systems based on member input consistent with the template for information-sharing

2. The Providers' Forum noted that the executive secretariat had continued to compile reports from each provider on their respective planned and operating systems, consistent with the template for information-sharing. It was noted that the executive secretariat would provide a consolidated set of reports for review prior to final publication.

Report on user and manufacturer workshops

3. The Providers' Forum took note of two workshops organized by Working Group A on compatibility and interoperability in 2009 to obtain worldwide expert input regarding characteristics that would aid or hinder interoperability. In that regard, the Providers' Forum noted that 20 responses to the questionnaire had been reviewed and that Working Group A would continue to organize workshops and solicit additional responses to the questionnaire. The Providers' Forum further noted that Working Group A would continue to focus on workshops on interoperability.

2. Open service information dissemination

Consideration of template for sharing and disseminating information on open service signal specifications and service standards

4. The representative of the United States made a presentation on Global Positioning System (GPS) open service provision practices. The United States proposed a new principle, for adoption by ICG, regarding the offering of open services. Subsequent to discussion of the proposal, it was decided to further consider it within Working Group A on compatibility and interoperability.

3. Service performance monitoring

Consideration of proposals to widely monitor the performance of open signals and provide timely updates to users regarding critical performance characteristics

5. The representative of the United States made a presentation on the benefits of civil GNSS signals/services monitoring. The United States proposed that the GPS Civil Monitoring Performance Specification (CMPS) could be used as a model for documentation of requirements for civil monitoring of other GNSS signals/services. The Providers' Forum agreed to hold further discussions on this item.

4. Spectrum protection: interference detection and mitigation

Exchange of views on radio-navigation satellite services (RNSS) spectrum issues and related agenda items under consideration by the International Telecommunication Union and its working parties

6. The representative of the United States presented ongoing activities of the International Telecommunication Union (ITU) related to the protection of the GNSS spectrum. The representatives of Japan and the Russian Federation expressed support for the United States proposal for providers to actively participate in the ITU Radiocommunication sector (ITU-R).

Consideration of the development of a strategy to detect and mitigate interference in GNSS worldwide

7. The representative of the United States presented information on coordination of domestic capabilities to identify, analyse and mitigate sources of interference to GPS and its augmentation systems. It was noted that the United States receives and processes interference reports from all over the world and then works to resolve them. It was also noted that within the United States, the Department of Homeland Security is developing a national sensor network to provide real-time monitoring for the protection of critical infrastructure.

8. The Providers' Forum noted that a series of regional GNSS workshops sponsored by the United States, the United Nations and other members of the Providers' Forum had been held beginning in 2001 and that the issue of interference detection and mitigation was often raised at those workshops. The Providers' Forum noted that currently there is no global capability to detect and mitigate interference, but it is widely recognized that such a capability is needed.

B. Other matters

1. Review and discussion of presented working groups reports

9. The co-chairs of the ICG Working Groups presented and submitted, for consideration by the Providers' Forum, a set of recommendations as contained

in the reports of the working groups.³ Working Group A on compatibility and interoperability submitted five recommendations; Working Group B on enhancement of the performance of GNSS services submitted two recommendations; and Working Group C on information dissemination and capacity-building and Working Group D on interaction with national and regional authorities and relevant international organizations each submitted one recommendation.

2. Chair and next meeting of the Providers' Forum

10. The Providers' Forum agreed that the European Community and the United States would co-chair its next meeting, to take place at the United Nations Office at Vienna on 7 June 2010.

3. Workplan of the Providers' Forum

11. Paragraph 2 of the workplan of the Providers' Forum⁴ was updated, deleting text that limited working group study of the principles of compatibility and interoperability to only various user applications and equipment manufacturers. The quantitative evaluation of compatibility was also included in the workplan.

12. Paragraph 5 of the workplan of the Providers' Forum was updated to reflect the development of system information templates that will be developed by Working Group A for consideration by the Providers' Forum.

4. Observer status

13. The Providers' Forum took note of the request of the Space Generation Advisory Council (SGAC) for observer status with ICG. The Provider's Forum also noted the Youth for Global Navigation Satellite Systems project of SGAC. The Providers' Forum was unable to reach consensus on this request and recommended that ICG invite SGAC to participate, in an expert capacity, in the work of Working Group C on information dissemination and capacity-building.

5. Glossary of terms

14. It was agreed that the Providers' Forum would consider at its next meeting the development of a glossary of terms related to the work of ICG and the Providers' Forum.

6. Compilation of decisions and conclusions

15. It was agreed that the Providers' Forum would consider at its next meeting the development of a document consolidating decisions and conclusions reflected in the reports of past meetings of the Providers' Forum.

³ A list of documents before the Fourth Meeting of ICG is contained in annex II.

⁴ See the revised workplan of the ICG Providers' Forum (ICG/PF/WP/SEP2009).

Annex I

List of States Members of the United Nations and governmental, intergovernmental and non-governmental organizations participating in the International Committee on Global Navigation Satellite Systems

China
India
Italy
Japan
Malaysia
Nigeria
Russian Federation
United Arab Emirates
United States of America
European Community
Civil Global Positioning System Service Interface Committee
Committee on Space Research
European Space Agency
International Association of Geodesy
International Association of Geodesy Reference Frame Sub-Commission for Europe (EUREF)
International Association of Institutes of Navigation
International Bureau of Weights and Measures (BIPM)
International Cartographic Association
International Earth Rotation and Reference Systems Service
International Federation of Surveyors
International Global Navigation Satellite System Service
International Society for Photogrammetry and Remote Sensing
International Steering Committee of the European Position Determination System
International Telecommunication Union
International Union of Radio Science
Office for Outer Space Affairs of the Secretariat

Annex II**Documents of the Fourth Meeting of the International
Committee on Global Navigation Satellite Systems**

<i>Symbol</i>	<i>Title or description</i>
ICG/PF/WP/SEP2009	Workplan of the Providers' Forum as amended
ICG/WGA/SEP2009	Report of the Working Group on Compatibility and Interoperability
ICG/WGB/SEP2009	Report of the Working Group on Enhancement of the Performance of Global Navigation Satellite Systems Services
ICG/WGC/SEP2009	Report of the Working Group on Information Dissemination and Capacity-Building
ICG/WGD/SEP2009	Report of the Working Group on Interactions with National and Regional Authorities and Relevant International Organizations
