Committee on the Peaceful
Uses of Outer Space

Sixth Meeting of the International Committee on Global
Navigation Satellite Systems

Note by the Secretariat

Contents

I. Introduction ................................................................... 2
   A. Background .................................................................... 2
   B. Structure and programme of the Meeting ............................ 2
   C. Attendance ..................................................................... 3
   D. Global navigation satellite systems applications seminar .... 4
   E. Documentation .................................................................. 4

II. Recommendations and decisions ............................................ 4

III. Joint statement .................................................................. 5

IV. Providers’ Forum .................................................................. 7

Annexes

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 ..................................................... 13

II. Documents of the Sixth Meeting of the International Committee on Global Navigation
   Satellite Systems .................................................................... 14
I. Introduction

A. Background

1. The International Committee on Global Navigation Satellite Systems (ICG) holds annual meetings to review and discuss developments on global navigation satellite systems (GNSS). The annual meetings also address GNSS science and innovative technology applications and future commercial applications. Representatives of industry, academia, Governments and providers and users of GNSS services share views on GNSS compatibility and interoperability. Annual meetings are utilized by the ICG membership, consisting of members, associate members and observers, to review and modify the ICG workplan and amend the terms of reference of ICG as necessary.

2. The Committee on the Peaceful Uses of Outer Space, at its fifty-fourth session, in 2011, noted with appreciation that ICG continued to make significant progress towards the goals of encouraging compatibility and interoperability among global and regional space-based positioning, navigation and timing systems and promoting the use of GNSS and their integration into infrastructures, particularly in developing countries.1

3. Pursuant to General Assembly resolution 65/97 and as part of the United Nations Programme on Space Applications, the Office for Outer Space Affairs of the Secretariat held the United Nations/United Arab Emirates/United States of America Workshop on Applications of Global Navigation Satellite Systems in Dubai from 16 to 20 January 2011 (A/AC.105/988) and the United Nations/Nigeria Workshop on the International Space Weather Initiative in Abuja from 17 to 21 October 2011 (A/AC.105/1015). These workshops were co-sponsored by the United States through ICG.

4. 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). The Fourth Meeting of ICG was held in Saint Petersburg, Russian Federation, from 14 to 18 September 2009 (A/AC.105/948). The Fifth Meeting of ICG was held in Turin, Italy, from 18 to 22 October 2010 (A/AC.105/982).

5. The Sixth Meeting of ICG was held in Tokyo from 5 to 9 September 2011 and was hosted by the Government of Japan.

B. Structure and programme of the Meeting

6. The programme of the Sixth Meeting of ICG included three plenary sessions and working group meetings. At the first plenary session of the Meeting, held on 5 September 2011, GNSS service providers and augmentation system providers

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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.

7. In accordance with the workplan of ICG, four working group meetings, held on 7 and 8 September 2011, 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 India and the European Space Agency); information dissemination and capacity-building (led by Japan and the Office for Outer Space Affairs); and reference frames, timing and applications (led by the International Federation of Surveyors, the International Association of Geodesy and the International Global Navigation Satellite Systems Service).

8. At its plenary sessions held on 8 and 9 September 2011, ICG considered the implementation of the recommendations of the working groups and plans to address the current and future work of each working group.

9. After considering the various items before it, ICG made the recommendations and decisions and adopted the joint statement summarized in section III below.

10. In conjunction with the Sixth Meeting of ICG, the Providers’ Forum held its seventh meeting in Tokyo on 4, 6, 8 and 9 September 2011 under the chairmanship of Japan and the United States (see section IV below).

C. Attendance

11. Representatives of the following States participated in the Sixth Meeting of ICG: China, India, Italy, Japan, Malaysia, Nigeria, Russian Federation, United Arab Emirates and United States of America. The European Union was also represented.

12. Representatives of Indonesia, Republic of Korea, Thailand and Viet Nam were invited to participate in an expert capacity in the work of the Sixth Meeting of ICG and to address it as appropriate.

13. ICG decided to invite, at its request, the observer for Australia to attend the Sixth Meeting of ICG and to address it, as appropriate.

14. The following United Nations entities were represented at the Meeting: the Office for Outer Space Affairs and the International Telecommunication Union.


16. ICG also decided to invite, at their request, the observers for the Interagency Operations Advisory Group (IOAG) and the Fédération Aéronautique Internationale (FAI) to attend the Sixth Meeting of ICG and to address it, as appropriate.
17. A list of States Members of the United Nations, United Nations entities, governmental, intergovernmental and non-governmental organizations participating in ICG is contained in annex I.

D. Global navigation satellite systems applications seminar

18. GNSS experts held a seminar on GNSS applications on 5 and 6 September 2011 as part of the Sixth Meeting of ICG. The seminar consisted of three sessions, entitled “Agriculture, fishery and information technology construction (precise positioning)”, “Geographic information system and disaster mitigation” and “Intelligent transportation systems and location-based services”. The primary purpose of the seminar was to raise awareness of issues and opportunities with respect to user applications and GNSS technology, for consideration by ICG and its working groups. During the seminar, 15 presentations were given by representatives of GNSS service providers, States Members of the United Nations and intergovernmental and non-governmental organizations dealing with GNSS applications. The presentations made at the seminar are available from the ICG information portal (www.icgsecretariat.org). An exhibition was also held near the site of the Meeting from 5 to 9 September 2011.

E. Documentation

19. A list of the documents of the Sixth Meeting is contained in annex II. The documents and further information on the Meeting programme, background materials and presentations are available from the ICG information portal (www.icgsecretariat.org).

II. Recommendations and decisions

20. At its plenary sessions held on 8 and 9 September 2011, ICG took note with appreciation of the reports of its working groups and its Providers’ Forum, which contained the results of their deliberations in accordance with their respective workplans.

21. ICG endorsed the decisions and recommendations of the working groups with regard to the implementation of the actions contained in its workplan.

22. Working Group D on reference frames, timing and applications reiterated its recommendation that it would be important to involve an official representative of the European Union in its discussions and deliberations.

23. The Chairman of the Meeting informed participants that a request for observer status with ICG had been received from IOAG, and a request for associate member status had been received from FAI.

24. ICG heard statements by the representatives of IOAG and FAI on their organizations’ plans for implementing GNSS applications and granted the organizations the status of observer and associate member respectively.
25. The representative of the European Union made a statement noting that the European Union would replace and succeed the European Community, including in ICG, and that the delegation of the European Commission accredited to ICG would become the delegation of the European Union.

26. The executive secretariat was requested to amend the terms of reference of ICG to reflect the addition of new members, and the replacement and succession of the European Community by the European Union in the terms of reference of ICG.

27. ICG noted that the document entitled “Extracts from reports of the International Committee on Global Navigation Satellite Systems and its Providers’ Forum” had been prepared by the executive secretariat. ICG agreed that the secretariat would further develop that document and make it available on the ICG information portal.

28. ICG agreed that, in view of the importance of the discussion about the future of ICG and its structure, it would continue to address that topic at the next meeting of ICG. It was also noted that an agenda item entitled “Future role of ICG” would be an item at the United Nations international meeting on GNSS applications, to be held in Vienna from 12 to 16 December 2011.

29. ICG accepted the invitation of China to host the Seventh Meeting, to be held in 2012, and noted the offer of the United Arab Emirates to host the Eighth Meeting, in 2013.

30. ICG agreed on a tentative schedule for the informal preparatory meetings for its Seventh Meeting, to be held during the forty-ninth session of the Scientific and Technical Subcommittee and the fifty-fifth session of the Committee on the Peaceful Uses of Outer Space in 2012. It was noted that the Office for Outer Space Affairs, as the executive secretariat of ICG and its Providers’ Forum, would assist in the preparation of those meetings and the activities of the working groups.

31. 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 2011 and maintaining the ICG information portal.

III. Joint statement

32. ICG adopted by consensus the following joint statement:

1. The Sixth Meeting of the International Committee on Global Navigation Satellite Systems (ICG) was held in Tokyo from 5 to 9 September 2011, to continue reviewing and discussing developments in global navigation satellite systems (GNSS) and to allow ICG members, associate members and observers to address recent developments in their organizations and associations with regard to GNSS services and applications. ICG also addressed GNSS space technology applications for agriculture, fishery, information technology construction (precision positioning), geographic information system, disaster mitigation, intelligent transportation system and location-based services.

2. The Meeting was hosted by the Government of Japan. Representatives of China, India, Italy, Japan, Malaysia, Nigeria, the Russian Federation, the United Arab Emirates and the United States of America, as well as the
European Union attended the Meeting. Representatives of the following intergovernmental and non-governmental organizations also attended: Civil Global Positioning System Service Interface Committee, Committee on Space Research, European Space Agency, European Position Determination System, International Federation of Surveyors, International Association of Geodesy (IAG) and IAG Reference Frame Sub-Commission for Europe, International Bureau of Weights and Measures, International Earth Rotation and Reference Systems Service and International GNSS Service. Representatives of the Office for Outer Space Affairs of the Secretariat and the International Telecommunication Union also attended. Australia was invited to attend as an observer. The representatives of the Interagency Operations Advisory Group and the Fédération Aéronautique Internationale also attended and were recognized by ICG as a new observer and as an associate member respectively. The representatives of Indonesia, Republic of Korea, Thailand and Viet Nam also participated.

3. ICG recalled that the General Assembly, in its resolution 65/97, welcomed the progress made by ICG towards achieving compatibility and interoperability among global and regional space-based positioning, navigation and timing systems and in the promotion of the use of global navigation satellite systems and their integration into national infrastructure, particularly in developing countries, and noted with satisfaction that ICG had held its fifth meeting in Turin, Italy, from 18 to 22 October 2010, which had been jointly organized by Italy and the European Commission.

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 reference frames, timing and applications.

5. ICG further noted that Working Group A on compatibility and interoperability addressed all four areas of its current workplan through an intersessional meeting held in June 2011 at the United Nations Office at Vienna and the two days of presentations and discussions conducted during the Sixth Meeting of ICG. Interference detection and mitigation, and open service provision and performance monitoring by multi-GNSS networks were the major areas of focus, leading to three of the working group’s four recommendations. The session on multi-GNSS monitoring and the session on interoperability were held jointly with Working Groups B and D, resulting in constructive dialogue with those working groups and an agreed plan of practical steps, including the establishment of a subgroup to collectively investigate international GNSS monitoring and assessment.

6. Working Group B on enhancement of the performance of GNSS services discussed, among other things, the dissemination of disaster information. It was noted that satellite navigation systems might provide essential contributions, but the service concept still needed further elaboration. Due to the importance of that issue a new work item was introduced in the Working Group’s workplan. In addition the existing actions in the current workplan were confirmed and were reflected by the Working Group members in their presentations, and good progress was shown in various areas, including indoor positioning, signal authentication, precise positioning, transportation, maritime
and space applications. Since more and more application-related issues were introduced and discussed within Working Group B, it was agreed to form a dedicated subgroup on applications.

7. Working Group C on information dissemination and capacity-building addressed further aspects of its workplan, including training for capacity-building in developing countries; promoting the use of GNSS technologies as tools for scientific applications; the International Space Weather Initiative; and regional workshops on applications of GNSS. A new item on education and training programmes on GNSS was added to its workplan.

8. Working Group D on reference frames, timing and applications completed development of templates describing the geodetic and timing references for the navigation satellite systems currently represented in ICG. The Working Group also proposed that the templates be published on the ICG information portal. ICG also welcomed progress in work by the International Bureau of Weights and Measures towards production of “Rapid Coordinated Universal Time (UTC)” as a more immediately accessible time reference that could be used to better harmonize the UTC broadcast by each GNSS. The Working Group recommended that interested system providers supply data from their respective monitor stations for inclusion in regular processing with the International GNSS Service (IGS) network of reference stations. Such inclusion is aimed at improving the alignment of the various GNSS reference frames with each other and with the International Terrestrial Reference Frame. An important new development was the endorsement by ICG of the IGS Multi-GNSS Experiment, which follows on from the previous endorsement by ICG of the multi-GNSS campaign in Asia and Oceania.

9. ICG accepted the invitation of China to host the Seventh Meeting of ICG in Beijing from 4 to 9 November 2012. The Office for Outer Space Affairs, as the executive secretariat of ICG and its Providers’ Forum, would assist in the preparations for the Seventh Meeting and for interim planning meetings and working group activities. ICG also noted the expression of interest by the United Arab Emirates to host the Eighth Meeting of ICG in December 2013.

IV. Providers’ Forum

33. The seventh meeting of the Providers’ Forum, co-chaired by Japan and the United States, was held in Tokyo in conjunction with the Sixth Meeting of ICG. The meeting consisted of four sessions, held on 4, 6, 8 and 9 September 2011. China, India, Japan, the Russian Federation and the United States, as well as the European Union, were represented at the meeting.

34. On 4 September, participants in the Providers’ Forum reviewed the agenda and meeting procedures for the Providers’ Forum and the Sixth Meeting of ICG, and discussed the future structure of ICG and the status of the ICG documents that provide supporting information.

35. On 6 September, the co-chair of the Providers’ Forum outlined the work that the Providers’ Forum had before it. The applications of IOAG for observer status and FAI for associate member status with ICG were also presented. The Providers’
Forum also took note of the correspondence with the Inter-Agency Space Debris Coordination Committee and the statutes of that Committee.

36. On 9 September, after consideration of the items 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. Open service information dissemination

   1. The representative of China gave a presentation on the preliminary positioning results using BeiDou observations and an analysis of the performance of the system. From those results, information on the accuracy available to the users of navigation and high-precision relative positioning could be derived. The accuracy shown in the presentation was very promising, although the BeiDou constellation had not been fully deployed.

2. Service performance monitoring

   2. The Providers’ Forum noted that Working Group A would have recommendations on the subject of service performance monitoring for further consideration by the Providers’ Forum.

3. Spectrum protection: interference detection and mitigation

   3. The representative of the United States provided information on the status of the United States domestic regulatory process related to conditional Federal Communications Commission (FCC) approval for LightSquared (LSQ) operations in the bands directly below and slightly above the radio-navigation satellite services (RNSS) L-1 allocation. FCC final approval was contingent upon determination that use of global positioning systems and global navigation satellite systems (GNSS) services were not adversely impacted by the planned LSQ operations. The FCC process was ongoing, and no determination had been made at that time. Testing of LSQ equipment was conducted for the purpose of evaluating the impacts of those operations on GPS use. It was further noted that the matter of ancillary mobile-satellite service operations adjacent to the RNSS band might be considered by the World Radiocommunication Conference to be held in 2012 and might be addressed through the radio bureaux working party process within the Radiocommunication Bureau of ITU. The Providers’ Forum noted that ITU referred to those operations as “complimentary ground component”.

   4. The representative of the United States further stated that if additional interference testing was conducted by the Government, it would consider including receivers using other systems’ signals, provided that all necessary coordination could be completed in time. The United States would provide a point of contact for interested system providers.

   5. The representative of the European Union noted that similar operations had been studied in Europe and found to be disruptive to other mobile satellite service operations and had thus been discarded as an implementation option.
6. The representative of Japan noted that input had been provided to FCC, stating the concerns of Japan regarding the operation. It was also noted that the official position of the Asia-Pacific Telecommunity was to oppose any action favourable to the complementary ground component that might be considered at the World Radio Conference to be held in 2012.

7. The representative of China noted that with the establishment of new systems and the increase of new frequency bands and applications of new services, more and more space systems would face this kind of issue. It was envisioned that this might lead to additional overlapping of frequency bands and more interference between systems. Since GNSS was a service-oriented system aimed at serving all humankind, this issue warranted significant attention throughout the world. The BeiDou system, as a member of the GNSS systems, would like to join with others in the discussion of the issue.

8. The representative of the European Union made a comment related to spectrum protection, stating that interference, detection and mitigation was an issue of concern to the European Union. There were policy issues related to GNSS jammers being discussed within the European Union. The co-chair of Working Group A noted that the Working Group would be considering a recommendation for a workshop on the issue of interference, detection and mitigation to be held in 2012.

B. Other matters

1. Report on a multi-GNSS demonstration project in the Asia/Oceania region

9. The representative of Japan presented a report on the progress of the multi-GNSS demonstration project. It was noted that the Japan Aerospace Exploration Agency (JAXA) received 11 applications as a result of a call for hosting JAXA receivers. Six organizations were now investigating participation in the network with their own receivers. It was also noted that a new call for joint experiments would be issued in the middle of September 2011 and that the third Asia-Oceania regional workshop on GNSS would be held from 1 to 3 November 2011 in Jeju, Republic of Korea. A request was made that Providers’ Forum members attend the workshop.

2. ICG information centres

10. The Providers’ Forum took note of the establishment of International Committee on Global Navigation Satellite Systems (ICG) information centres at the regional centres for space science and technology education, affiliated to the United Nations, which were utilized as hubs for training and dissemination of information on global applications of GNSS. The Providers’ Forum also noted that China offered to make available an information centre at Beihang University in Beijing.

11. The representative of China was of the view that the providers should assume more responsibility for disseminating GNSS information and facilitating awareness of GNSS.
3. **IGC information portal**

   12. The Providers’ Forum recalled that at its planning meeting in June 2011, it had been agreed that input on improvements of the ICG information portal would be provided to the ICG executive secretariat for review. The Providers’ Forum also noted that in July 2011, the delegation of the United States had submitted, for consideration by the ICG executive secretariat, a website redesign proposal.

   13. The Providers’ Forum took note of the concepts of the website redesign proposal presented by the representative of the United States and agreed that the United States would circulate its proposal to the Providers’ Forum members for their comments.

4. **Glossary of terms related to the work of ICG and its Providers’ Forum**

   14. The Providers’ Forum noted that the secretariat had prepared the draft glossary of terms on the basis of contributions from global and regional system providers, scientists from international and regional organizations and associations dealing with GNSS services and applications, academia and industry. It was noted that once finalized, the glossary would serve both as a consolidated report on GNSS terminology and as a resource for use within and outside ICG, as well as supporting information for education and training programmes on GNSS.

   15. The Providers’ Forum agreed that the glossary of terms would be considered and finalized at its next meeting.

5. **Document consolidating decisions and conclusions**

   16. The Providers’ Forum noted that in response to a request made at its fourth meeting, in 2009, the secretariat had prepared a document consolidating decisions and conclusions reflected in the reports of past meetings of ICG and its Providers’ Forum for consideration at its present meeting.

   17. The Providers’ Forum agreed that the document entitled “Extracts from reports of ICG and its Providers’ Forum” would be posted on the ICG information portal. The Providers’ Forum also agreed that the document would be updated to reflect the proceedings of its present meeting.

6. **Future structure of ICG**

   18. The Providers’ Forum agreed that, as proposed by the co-chair, an agenda item entitled “Future role and work of ICG and its Providers’ Forum” should be considered at the next meeting of the Providers’ Forum and that specific proposals might be made at that time.

   19. The representative of China was of the view that the discussion topic on the future structure of ICG seemed to entail a lengthy process.

   20. The representative of the European Union was of the view that the proposed user forum seemed to be redundant in view of the working groups of ICG and that the addition of subgroups made it difficult to attend all the extra meetings. It was also noted that rules and procedures for the designation of
chairs were lacking in the current terms of reference of ICG and that this topic should be considered at the next meeting of the Providers’ Forum.

21. On the basis of deliberations and in view of the importance of the topic, the co-chair proposed to include an agenda item at the United Nations International Meeting on GNSS applications to be held in December 2011 in Vienna. It was further noted that that would give experts an opportunity to propose recommendations on the future work of the ICG and its Providers’ Forum, which could be considered as part of the discussion at the next meeting of the Providers’ Forum.

7. Future structure of ICG


8. Review and discussion of presented ICG working group reports

23. The co-chairs of ICG working groups presented and submitted, for consideration by the Providers’ Forum, the recommendations contained in the reports of the working groups. Working Group A submitted four recommendations; Working Group B submitted six recommendations; Working Group C submitted two recommendations; and Working Group D submitted three recommendations.

24. The representative of the United States was of the view that under the existing process of the Providers’ Forum revising the recommendations of the working groups, the working groups might no longer wish to go forward with the proposed recommendation. The Providers’ Forum noted that discussions would be held with the co-chairs of the working groups regarding the modification of recommendations.

9. Membership in ICG

25. The Providers’ Forum took note of the request of the Interagency Operations Advisory Group (IOAG) for observer status and the request of the Fédération Aéronautique Internationale (FAI) for associate member status with ICG. The related correspondence of those organizations was before the Providers’ Forum.

26. The Provider’s Forum decided to recommend to ICG that IOAG and FAI should become an observer and an associate member of ICG respectively.

27. The Providers’ Forum also took note of the correspondence with the Inter-Agency Space Debris Coordination Committee and the statutes of that Committee. Some delegations expressed the view that it was not clear what type of relationship was being requested and expressed concerns about creating a new type of ICG relationship. The Providers’ Forum agreed that, as proposed by the co-chair, that issue would be considered at the next meeting of ICG and that more detailed information would be provided at that time.
10. Replacement and succession of the European Community by the European Union in the terms of reference of ICG and its Providers’ Forum

28. The Providers’ Forum took note that the European Union would replace and succeed the European Community and that this change would not have any impact on that organization’s future representation in ICG. The Providers’ Forum agreed that, as proposed by the co-chair, the executive secretariat would distribute the letter received from the Council of the European Union to the members of the Providers’ Forum and that the name change request would be adopted by electronic mail.

11. Chair and next meeting of the Providers’ Forum

29. The Providers’ Forum agreed that China and the United States would co-chair the Forum’s next meeting, to take place at the United Nations Office at Vienna in conjunction with the fifty-fifth session of the Committee on the Peaceful Uses of Outer Space, to be held in 2012. The Forum also agreed on a tentative schedule for a planning meeting during the forty-ninth session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, in 2012.
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 Union
Civil Global Positioning System Service Interface Committee
Committee on Space Research
European Space Agency
Fédération Aéronautique Internationale
Interagency Operations Advisory Group
International Association of Geodesy
International Association of Geodesy Reference Frame Sub-Commission for Europe
International Association of Institutes of Navigation
International Bureau of Weights and Measures
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 Sixth Meeting of the International Committee on Global Navigation Satellite Systems**

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<th>Symbol</th>
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<tr>
<td>ICG/PF/TOR/2011 (amended)</td>
<td>Terms of reference of the Providers’ Forum</td>
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