



**ICG WORKING GROUP A**  
**Compatibility and Interoperability of Global and Regional  
Navigation Satellite Systems and Satellite-based Augmentations**

**Intersession Meeting**

**Olsztyn, Poland**

**23-26 July 2012**

**In Conjunction with *IGS Workshop 2012***

**FINAL AGENDA**

as of 26 July 2012

**With Proposed Actions & Potential ICG-7 Recommendations**

**Monday, 23 July**

**1530-1700 Introduction – Plenary Room**

- 1) WG-A Co-chairs Opening Remarks
- 2) Approval of the Agenda
- 3) Subgroup Coordination

**Tuesday, 24 July**

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**0830-1200 Compatibility Subgroup Meeting – Splinter Room 3**  
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**1330-1500 Session 1: GNSS Updates\* – Plenary Room**

- 1) System Provider Updates
  - Beidou/COMPASS – Yuanxi YANG, CNAGA
  - Galileo - Dominic HAYES, European Commission
  - QZSS – Satoshi KOGURE, JAXA
  - GLONASS – Dmitry MARARESKUL, ISS Reshetnev Company
  - GPS – Devin O'DOWD, GPS Program

- 2) Group Discussion

Note: IGS Workshop participants are invited to attend all sessions in the Plenary Room

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**1530-1700 Meeting of the Subgroup on International GNSS Monitoring and Assessment – Plenary Room**  
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**Wednesday, 25 July**

**0830-1200 Session 2: GNSS Compatibility – Splinter Room 3**

- 1) Report of the Compatibility Sub-group

*Takahiro MITOME, Dominic HAYES*

Conclusions, Actions, and Recommendation

- 1) The Sub-group agreed on continuing the discussion to facilitate the compatibility among RNSS systems, including potential multilateral discussion frameworks and the frequency bands to be considered.
- 2) The Sub-group discussed Open Service GNSS Performance Parameters and noted there is a risk to reach the DOP saturation limit when the number of RNSS satellites are increased in a way to improve the performance and the solution geometry, which depends on scenarios.
  - **Action to Subgroup:** Develop a plain language consensus definition of the term “DOP Saturation Limit” as an important consideration for Multi-GNSS open service availability. Circulate to the WG for consideration before ICG-7
  - **Action to WG-A:** Members are invited to prepare inputs related to the DOP Saturation Limit for discussion at the ICG-7 meeting of WG-A
  - **Action to the U.S. WG-A Members:** Circulate a draft template with content for open service performance parameters by September 10, 2012
  - **Action to WG-A:** Representatives from each system provider should review the draft template and prepare feedback for presentation and discussion at the ICG-7 meeting of WG-A
- 3) The Sub-group agreed to keep monitoring the ITU activities for new spectrum for IMT (WRC-15 agenda item 1.1) to avoid potential interference into RNSS.
- 4) The Sub-group also agreed on continuing to watch the 700 MHz mobile service channel plan in Europe, which is related to WRC-15 agenda item 1.2, and recognized the importance of the activities to prevent potential harmonic interference into RNSS.

## ICG WG-A AGENDA

- **Action to WG-A:** Investigate specific IMT spectrum utilization plans (ITU-R M.1036-4) within relevant Administration's and regional groups and investigate whether interference mitigation methods already exist within the telecommunications industry
- **Action to Subgroup Chairs:** Modify the subgroup ToR to address the investigation of unlike service interference to GNSS (RNSS) and propose text for the WG-A work plan to also address this area of work

### **Potential ICG-7 Recommendation 7A.2.1**

*ICG members are encouraged to actively participate in the ITU-R and regional WRC-15 preparatory work on new IMT spectrum to ensure that proposals do not impact existing and future GNSS operations. Members may also consider forming links with other satellite groups already defending satellite spectrum.*

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### **1330-1530 Meeting of the Subgroup on International GNSS Monitoring and Assessment – Plenary Room**

- 1) Update on International GNSS Monitoring and Assessment Service (iGMAS)

*China*

- 2) Update on the Multi-GNSS Asia (MGA) Demonstration Campaign

*Japan*

- 3) Update on International GNSS Service (IGS) Multi-GNSS Activities and Plans

*IAG/IGS/GGOS*

- 4) Status of ICG-6 recommendations

- a) Recommendation 4.1: Consensus on Open Service GNSS performance parameters

- b) Recommendation 4.2: Formation of a team to optimize international GNSS monitoring and assessment

**1600-1700      Session 4: Open Service Information Sharing and Service Performance Monitoring (International GNSS Monitoring and Assessment) – Plenary Room**

- 1) Report of the Sub-group on International GNSS Monitoring and Assessment  
*Satoshi KOGURE, Yuanxi, YANG*
  
- 2) Discussion

Recommendation

**Potential ICG-7 Recommendation (7A.4.1)**

- *Redefine the current IGMA sub-group of WG-A (with B & D participation) as an ICG Task Group. Their task will be to:*
  - *Determine Service Parameters to Monitor*
  - *Determine what gaps exist in current monitoring*
  - *Recommend what should be monitored by:*
    - *Individual GNSS monitoring/control segments*
    - *Shared sites of 2 or more GNSS through bilateral agreements*
    - *Global monitoring of Multi-GNSS parameters*
  - *Propose Organizational Approach*
    - *Avoid Duplication?*
    - *Role of the current/planned IGS?*
    - *Relationship to the ICG?*

**Thursday, 26 July**

**0830-1200      Session 3: Spectrum Protection - Interference Detection and Mitigation (IDM) – Splinter Room 3**

- 1) Report on outcomes of the IDM Workshop (June 2012)  
*Jeff AUERBACH, Takahiro MITOME*

June 2012 Workshop Conclusions

**Sources of interference**

## ICG WG-A AGENDA

1. The ICG should develop educational material such as a downloadable pamphlet or other web content on sources of interference to GNSS. The material should include an explanation why radio navigation satellite services (RNSS) are different than radio communications services and more vulnerable to interference

### **RNSS Spectrum Protection**

2. The ICG should recommend that its member state participants identify a suitable GNSS monitoring site or operations center to be recognized by the ITU as an official part of its International interference monitoring network.
3. ICG system providers should be reminded to adhere to the existing template for sharing information between service providers and should exchange information related to domestic spectrum management activities applicable to GNSS.

### **Current and future information sharing, dissemination, collaboration and standardization**

4. The ICG should compare the existing ITU interference report to the reporting form used by the U.S. and other forms under development in order to develop a guideline or best practice for GNSS interference reporting.

### **Concepts and Techniques for Interference Detection**

5. The ICG should consider initiating a process to develop guidelines for mobile GNSS device manufacturers that are interested in contributing interference detection information to national reporting authorities or automated detection networks

### **Continuation of IDM Workshops**

6. System providers and ICG participants should identify experts to participate in the next IDM workshop and reach a consensus on the next meeting date and location.

## Actions and Recommendations

### **Potential ICG-7 Recommendation (7A.3.1) - Education & Outreach Regarding Sources of GNSS Interference**

*The ICG should develop educational material such as a downloadable pamphlet or other web content on sources of interference to GNSS. The material should include an explanation why radio navigation satellite services (RNSS) are different than radio communications services and more vulnerable to interference*

## ICG WG-A AGENDA

### ➤ **Related Actions to WG-A:**

- Members, with the EU as Lead, will develop sample educational material on GNSS Interference to present at ICG-7 in conjunction with this recommendation.
- The involvement of the ITU will be pursued by the WG

### **Potential ICG-7 Recommendation (7A.3.2) - Continuation of IDM Workshops**

- *The ICG should sponsor additional GNSS Interference Detection & Mitigation (IDM) Workshops*
  - *System Providers and ICG participants are encouraged to identify experts to participate in the next workshop, scheduled to occur in Honolulu, Hawaii in conjunction with the ION Pacific PNT Meeting, April 22-25, 2013*
  - *Specific expertise desired includes:*
    - *ITU Radio Bureau officials*
    - *Spectrum Regulators from System Providers and Administrations in the Asia-Pacific Region*
    - *Representatives of the mobile telecommunications and automotive electronics industries utilizing GNSS*
    - *IGS and National GNSS reference station network developers*

- **Related Action to WG-A:** Members will provide feedback to the Co-Chairs on their ability to attend the proposed workshop and recruit desired expert attendees by September 30, 2012

### ➤ **Additional Actions:**

- **WG-A Co-Chairs** will request that the ITU-BR representative to the ICG provide the working group with the current list of ITU-recognized interference monitoring network sites
- **WG-A Co-Chairs** will redistribute the existing ICG Providers Forum template for sharing information between service providers
- **WG-A Members** will compare the existing ITU interference report to the GNSS-specific reporting form used by the U.S. and any other GNSS-specific forms under development. Provide views on whether a standardized form is desirable at the ICG-7 WG-A meeting

**1330-1530 Session 5: GNSS Interoperability – Plenary Room**

- 1) Group Discussion
  - a. Proposal from ICG-6 meeting to evaluate and discuss interoperability under a new or existing subgroup

Recommendation

**Potential ICG-7 Recommendation (7A.5.1)**

- *Consistent with the principle of interoperability and its definition, and the implementation of previous ICG recommendations related to interoperability, **the ICG should host a user/industry workshop in conjunction with the ION Pacific PNT meeting, April 22-24 2013.***
- *The ICG will request inputs from potential participants prior to the workshop through existing web sites related to GNSS information dissemination, conferences, major PNT organizations and events.*
- *The following interoperability subjects may be addressed:*
  - *Potential for a common third open service signal*
  - *Frequency diversity vs. frequency commonality*
  - *DOP improvement with the addition of 2<sup>nd</sup>, 3<sup>d</sup>, 4<sup>th</sup>, N<sup>th</sup> global constellation*
  - *System provider time and geodetic reference frame implementation as described by the ICG WG-D templates*
  - *Potential opportunities to utilize existing or planned spare capacity in civil/open service or SBAS navigation messages in order to increase multi-GNSS interoperability*

➤ **Related Action to WG-A:**

- No later than August 20, 2012, each participating system provider will provide the WG-A Co-Chairs with a point of contact for developing the agenda and web site material for the proposed Interoperability workshop to be held in conjunction with ION Pacific PNT 2013
- Before ICG-7, the identified team will begin developing a draft agenda and other web-based material for consideration by the Committee

**1530-1700 Session 6: Conclusion – Plenary Room**

- 1) Any unfinished business
- 2) Review of recommendations and actions
- 3) Closing remarks
- 4) Adjourn