Recommendation 8A.2.1 for Committee Decision

Prepared by: Working Group A

Date of Submission: 13 November 2013

Issue Title: IMT-GNSS Compatibility (Revision to 7A.2.1)

Background/Brief Description of the Issue:

It is already recognized that compatibility is one of the key elements to ensure interoperability between RNSS systems. In parallel it is also important to minimize non-RNSS emissions entering into RNSS spectrum so that the benefits of interoperability are not negated by reduced performance due to interference.

Because international spectrum issues are under the responsibility of the International Telecommunication Union (ITU), it is essential to keep track of activities at the ITU that could impact RNSS spectrum. In particular, when new allocations are being considered for inclusion in the Radio Regulations, it should be ensured that these do not have the potential to cause harmful interference into RNSS.

Discussion/Analyses:

At the 2012 intersessional meeting of WG-A, the Compatibility Subgroup agreed to keep monitoring the ITU activities for new spectrum for IMT (WRC-15 agenda item 1.1) to avoid potential interference into RNSS. At the 2013 intersessional meeting, it was recognized that potential concern on the protection of RNSS spectrum from new IMT allocations still exists, since some of the candidate bands for IMT currently being discussed within ITU Joint Task Group (JTG) 4-5-6-7 may affect the existing RNSS allocations. These include the 1300-1400, 1518-1559, and 1610-1660.5 MHz bands.

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.

WG-A will 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.

Recommendation of Committee Action:

ICG members are encouraged to actively participate in the ITU-R and regional WRC-15 preparatory work on new IMT spectrum allocations (including JTG 4-5-6-7 until August 2014), 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.

Recommendation 8A.2.2 for Committee Decision

Prepared by: Working Group A

Date of Submission: 13 November 2013

Issue Title: Providers Update to Current and Future System

Background/Brief Description of the Issue:

In 2010, the ICG Providers Forum members put together a publication titled "Current and Planned Global and Regional Navigation Satellite Systems and Satellite-based Augmentation Systems" in an effort to provide the user community and receiver-producing industry with a clear and consistent description of the systems. The publication indicates that the information will be updated as necessary to reflect changes to the information.

Discussion/Analyses:

At the 2013 Intersessional Meeting of WG-A, the meeting participants agreed that some of the information in the publication has changed, and therefore a recommendation should be developed to update the publication prior to ICG-10 in 2015.

Recommendation of Committee Action:

System Providers should provide updated information regarding global and regional navigation satellite systems and augmentations in time for the publication of a new edition of the Providers Forum's Current and Planned Global and Regional Navigation Satellite Systems and Satellite-Based Augmentation Systems before ICG-10. The updated information should include observed or expected open service performance.

Recommendation 8A.3.1 for Committee Decision

Prepared by: Working Group A

Date of Submission: 13 November 2013

Issue Title: Education & Outreach Regarding Sources of GNSS Interference (Revision to 7A.3.1)

Background/Brief Description of the Issue:

Reception of GNSS signals can be affected by a range of different factors and many users of GNSS receivers may not be familiar with how GNSS works or even basic radio principles (like radio signals being blocked by objects). A user's expectations of GNSS reception could play a role in reducing the likelihood that interruption to GNSS reception (when entering a building for example) would cause negative effects. For this reason educating users on what to expect of their GNSS receiver in certain conditions would help promote 'responsible use' of GNSS receivers. This could similarly be extended to other types of users, (professional users for example) to mitigate against interruption to businesses that rely on GNSS reception for key activities.

Recent regulatory proposals by one administration also suggest that it may be worthwhile explaining why reception of low power level GNSS signals is unlike any other radio system and that the spectrum used by GNSS requires particular considerations when making new frequency allocations around the same range.

Discussion/Analyses:

At the 2012 Intersessional Meeting of WG-A, members, with the EU as lead, agreed to develop sample educational material on GNSS Interference to present at ICG-7. The involvement of the ITU was also to be pursued.

The second Workshop on Interference Detection and Mitigation in 2013 discussed the role of GNSS on a country's critical infrastructure. At the 2013 Intersessional Meeting of WG-A, the participants reviewed the recommendation 7A.3.1 and agreed that the recommendation requires further work and that the information material should emphasize the importance of GNSS to critical infrastructure.

Recommendation of Committee Action:

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, and will emphasize the importance of GNSS services to critical public and private sector functions, infrastructure, and economic activity.

Recommendation 8A.3.2 for Committee Decision

Prepared by: Working Group A

Date of Submission: 13 November 2013

Issue Title: GNSS Interference Detection Reporting Procedures

Background/Brief Description of the Issue:

Receiving reports of GNSS interference is important to system providers and GNSS users alike. The information received from these reports can be used in a variety of ways, from maintaining the integrity of the system to being able to warn users of potential outages. Exchange of this information between states could be a valuable tool for helping to mitigate interference events and could also alert system providers of potential issues.

Discussion/Analyses:

At the first Workshop on Interference Detection and Mitigation (IDM) in 2012, the concept of developing a guideline or best practice for GNSS interference reporting was discussed. The participants agreed that this is an important topic and continued the discussion at the second IDM Workshop in 2013. At the 2013 Intersessional Meeting of WG-A, the participants agreed that a smaller group should discuss this in more detail to develop a common set of guidelines to be considered for reporting GNSS interference.

Recommendation of Committee Action:

Working Group A should form a Task Force on GNSS Interference Detection reporting procedures and system development.

- Initially, the task force will focus on developing a common set of information to be reported to GNSS civil service centers.

- Next, the task force will focus on establishing routine communications among the centers.

- Finally the task force will develop guidelines for common capabilities to be considered in the development of future national IDM networks.

Recommendation 8A.4.1 for Committee Decision

Prepared by: IGMA Sub-Group (Working Group A, B and D)

Date of Submission: 12 November 2013

Issue Title: Update Recommendation on IGMA ICG-7A4.1 for its Further Development

Background/Brief Description of the Issue:

Considering that:

IGMA was established as a joint ICG sub-group by recommendation of WG-A (see appended recommendation ICG-7 4.1, which includes the IGMA work plan and charter).

ICG approved recommendations from WG-D to endorse MGA (ICG-4, WG-D #5) and IGS MGEX (ICG-6 WG-D #13).

Recognizing the on-going activities of the IGS, MGA/MGMNet, iGMAS, and Russian Monitoring and assessment system, those networks and systems are expanding their monitoring capability to track and monitor multiple constellations.

The Subgroup had three meetings and collected proposals on the parameters set to be monitored by IGMA.

Discussion/Analyses:

Due to sub-group discussions and activities over the past year, progress against the approved work plan is evident. Increasing interest by the wider ICG and discussions at ICG-8 indicated updates to recommendation A7 4.1 were necessary. Therefore, the sub-group has agreed to:

- Reaffirm the 2013-2015 work plan of IGMA and distribute to ICG members, associates and observers and other interested groups

- Share study progress on OS PS with WG-A Compatibility Subgroup and iterate investigation on the parameters

- Seek contribution to IGMA activities by the broader ICG community

- Promote closer cooperation of the identified IGMA organizations (IGS, MGA, iGMAS, Russia)

- Study how to disseminate monitoring and assessment results, such as the concept of "Service Net" proposed by China

- Encourage participation in the IGMA plenary and splinter sessions during the IGS 20th Anniversary Symposium, June 22-26, 2014 in Pasadena, CA, USA

Recommendation of Committee Action:

Recommendation 7A.4.1 is proposed to be updated as follows;

- Redefine the current IGMA joint sub-group of WG-A, B & D as an ICG Task Force. Their task will be to:

    – Determine Service Parameters to Monitor - definition and methodology to be coordinated with WG-A Compatibility sub group study

    – Determine what gaps exist in current and planned monitoring and assessment

    – Consider organizing a workshop on IGMA parameters, services and methodologies

- 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 an Organizational Approach that:

    • Coordinates and integrates the related activities for identifying parameters

    • Avoids Duplication

    • Considers the role of the current/planned IGS and

    • Defines the Relationship of the proposed organization to the ICG

- Explore methods to disseminate monitoring and assessment results, considering specific proposals from system providers

Recommendation 8A.5.1 for Committee Decision

Prepared by: Working Group A

Date of Submission: 13 November 2013

Issue Title: Interoperability Task Force

Background/Brief Description of the Issue:

At the ICG-5 meeting of WG-A, the co-chairs presented a summary report of user community views on interoperability, with the following findings:

- Priorities include common carrier frequencies, common time scale & reference systems, common modulation, and collocation of reference stations

- Service-related assurances viewed as important by almost all respondents

- It is difficult to draw more detailed conclusions -many respondents did not appear to understand the underlying issues

- ICG Principle of Interoperability and its definition seems valid - No substantial changes to definition required

- Benefits of interoperability include better availability, accuracy, and ability to support RAIM

- Interviews probably were needed

As a result of this presentation, the ICG recommended that interested members of WG-A develop a new approach to the continued collection of user and industry views on interoperability. This new approach was carried forward at the WG-A 2012 intersessional meeting, and a recommendation to hold an interoperability workshop was put forth to be attended by key technical experts. This workshop was held in April 2013 in conjunction with the ION Pacific Conference. Industry participants were presented with a series of questions in advance of the workshop, and had an opportunity to explain and expand upon their answers.

Discussion/Analyses:

At the 2013 Intersessional Meeting of WG-A, the participants discussed preliminary results of the workshop and agreed that holding these workshops was a successful way for the WG-A members to get feedback about user and industry views on interoperability. The members of WG-A agreed that the results of the workshop and questionnaire should be compiled for further analysis through the formation of a task force consisting of Provider representatives. Each of the Providers should also consider hosting a workshop to get further feedback from industry.

Recommendation of Committee Action:

Consistent with the principle of interoperability and its definition, and the implementation of previous ICG recommendations related to interoperability, Working Group A should form a task force to complete efforts to collect and analyze user community and industry views on interoperability

- The task force will analyze the results of the April 2013 interoperability workshop and adjust the questions for industry accordingly, in preparation for additional workshops to be hosted by each system provider

- The results of each workshop will be consolidated and analyzed by the Task Force in preparation for the 2014 intersessional meeting of Working Group A and ICG-9