

**Multi-GNSS Asia (MGA)**  
**TERMS OF REFERENCE**

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**PREAMBLE**

Over the next decade we will see next generation Global Navigation Satellite Systems (GNSSs) being deployed, including the U.S.'s modernized GPS-IIF and planned GPS-III, the revitalized (and later to be modernized) GLONASS from Russia, Europe's Galileo system, and China's BeiDou system. Furthermore, a number of Space Based Augmentation Systems (such as Japan's QZSS), and Regional Navigation Satellite Systems (such as India's IRNSS) will add extra satellites and signals to the multi-constellation GNSS 'mix'. What we learned in the GPS-only era will have to be augmented with new knowledge, about receiver hardware, algorithms, applications and user requirements. Asia Oceania Multi-GNSS Demonstration Campaign is the means by which the Asia Oceania region can gain early experience with the new signals and services based on multi-constellation GNSS.

**BACKGROUND**

The concept of the Multi-GNSS Demonstration Campaign in the Asia Oceania region was introduced by JAXA at the 4th meeting of the International Committee on GNSS (ICG) on 15 and 16 September 2009. The concept of the Multi-GNSS Demonstration Campaign in the Asia Oceania region relates to voluntary activities over the coming five or more years to promote the testing, development and adoption of new products and services based on multi-constellation GNSS. As a result of discussion, the ICG decided to support the Campaign. The specific plan of the Campaign was discussed at the first Asia Oceania Regional Workshop on GNSS on 25-26 January 2010 in Bangkok. The Multi-GNSS Demonstration Campaign in the Asia-Oceania region was declared to start at the second Asia Oceania Regional Workshop on GNSS on 21-22 November 2010 in Melbourne. The organization of Multi-GNSS Asia (MGA) was established with the aim to promote the Campaign activities in 4 September 2011 in Tokyo.

**1. OBJECTIVES**

Our goal is to promote social progress and better standards of life in the Asia Oceania region through the application of “Multi-GNSS” technologies for such purposes as, for example, the mitigation of environmental and natural hazard impacts so as to ensure a safe and secure society, and the encouragement of economic growth by peaceful utilization of “Multi-GNSS” products and services. In order to achieve this goal, the main objective of MGA is to encourage GNSS signal and service providers and user communities in the Asia Oceania region to develop new applications, and to carry out experiments or demonstrations by using all available “Multi-GNSS” systems whose interface control documents are public, on a best efforts basis in the spirit of international cooperation. Those experiments or demonstrations are targeted not only academic purposes but also business and industry purposes to realize the operational business services of Multi-GNSS

## **2. MEMBERSHIP**

MGA membership is open to any organization including, but not restricted to, GNSS signal providers, government agencies, international organizations, private companies, universities, and research institutes with an interest in GNSS utilization in the Asia Oceania region. The membership should be balanced with respect to organizational representation and geography.

The responsibilities of the member include:

- To participate in the regional GNSS workshop organized by MGA,
- To formulate and support the objectives of an implementation plan,
- To promote and support capacity building projects,
- To promote outreach projects,
- To assist in the formulation of plans for future activities,
- To maintain a point of contact,
- To investigate user requirements,
- To support the secretariat.

## **3. ORGANIZATION**

The MGA organization consists of several components, such as the Steering Committee, Working Group, Secretariat, and Observer.

### **- Steering Committee**

The Steering Committee consists of representatives from each Working Group and appointed members. The term of the Steering Committee member shall be two years. But it can be extended up to three times. A person who has retired from the Steering Committee can nominate the successor, and the Steering Committee shall make the final decision whether to accept the nomination or not. The two co-chairs are

selected from the members of the Steering Committee. The term of the chair shall be two years. But it can be updated only once. The chair is changed every other one year and arranged the overlap period for one year. A person who has retired from the co-chair will become an advisor. The advisor can participate in the Steering Committee as an observer. The term of the advisor shall be two years. It cannot be extended. The Steering Committee meeting shall be held regularly. The members who are not able to attend the Steering Committee meeting may delegate to the co-chairs. Most decisions of the Steering Committee shall be accepted with a 1/2 majority vote of all members. The voting may be by the participants at the meeting, via the internet, and by members who have delegated to the co-chairs. Changes to the membership, which shall be proposed by one or more current members, shall be accepted with a 2/3 majority vote of all members. The persons approved to participate by the co-chairs can attend the meeting of the Steering Committee as observers.

The responsibilities of the Steering Committee are:

- To define the functions and procedures of MGA and maintain the “Terms of Reference”
- To manage general activities of the Campaign.
- To endorse the proposed plan for joint demonstrations including the Multi-GNSS receiver allocation.

The responsibilities of the co-chairs of the Steering Committee are:

- To chair the meeting of the Steering Committee and MGA membership forum
- To report the results of the meeting of the Steering Committee and Annual Conferences
- To act as representatives of the Steering Committee

- Working Group (WG)

WGs will be established as outcomes of discussions at the annual workshop, and will be terminated with the presentation of the results of the associated activities (demonstrations, experiments, etc.). Each WG consists of co-chair, representative of several Teams and other members selected by the chair of the WG. Each WG will focus on a particular topic related to Multi-GNSS applications development and experiments. A WG may have responsibility for one or several Teams, either conducted jointly or independently. Specific WGs are described in Appendix I. List of Working Groups.

- Team

Team is a minimum unit of the MGA organization, which is defined to implement each joint application development and demonstration under each WG, which will be largely managed by bilateral cooperation, depending on the category of the applications and the location where the experiment or demonstration will be conducted. Teams which have same or similar objectives

and need common equipment like receivers can collaborate on such projects through WG discussion. WG will coordinate the sharing of resources among teams.

- Secretariat

Secretariat has the following responsibilities:

- To support the establishment of experiments related to Multi-GNSS applications in order to demonstrate the benefits of Multi-GNSS, as well as to highlight the importance of interoperability among Multi-GNSS systems.
- To share information on user needs and requirements related to Multi-GNSS among the GNSS signal providers.
- To support the activities of the Working Groups.
- To support activities that assist in securing funding to conduct the experiments and demonstrations.
- To organize annual workshops in the Asia Oceania region so as to facilitate the development of joint experiment plans and to act as a forum for reporting the results of such experiments.
- To collaborate with UNOOSA's International Committee on GNSS (ICG) and related organizations.
- To be the contact agent for matters related MGA.

- Observer

Observer is defined as an international or local organization which supports the Multi-GNSS demonstration campaign activity.

#### **4. OPERATION**

- Regional Workshop

The MGA Conference shall be held once a year in order to share information and experiences, and to discuss the activities of MGA. The annual workshop will be hosted in a country of a participating organization in the Asia Oceania region. The annual workshop may be held jointly with the other symposiums and conferences related to GNSS in the region, such as the International Symposium on GPS/GNSS and IGNS. The meeting of the Steering Committee shall be held at the same time as the annual workshops.

- Experiment Opportunities

The Experiment Opportunities shall be provided to the MGA participating organizations to aware the user benefit of Multi-GNSS utilization. All MGA participating organizations may

join the opportunities with their interests. Product or Service providers such as receiver manufacturers may organize the opportunities. The contents of the experiment may be discussed in the annual workshops and the results of the experiments may be shared in the workshop.

- Membership Forum

The Membership Forum is a closed meeting for all MGA participating organizations. The purpose of the meeting is transparency for the participants and emphasis of MGA membership. The meeting shall be held at the same time as the annual workshops

## **5. ACCESSION**

- The organization, defined in the paragraph of MEMBERSHIP, may participate as an MGA member if approved by a 1/2 majority of all members of the MGA Steering Committee.
- If an organization wishes to participate as an MGA MEMBER, it shall express its intention by sending a formal letter to MGA.
- As soon as MGA receives the formal letter, the Steering Committee will consider it and respond to it by the formal letter of the co-chairs of the MGA.
- The procedure defined in the paragraph of ACCESSION shall be managed by the Secretariat on behalf of MGA.

## **6. WITHDRAWAL**

Any participating organization may withdraw from the MGA by notifying the chairs of the MGA components in which the organization is involved, as well as the Secretariat of MGA.

## **7. AMENDMENT**

This “Terms of Reference” may be modified if approved by a 2/3 majority of all members of the MGA Steering Committee.

## **8. MATTERS NOT PROVIDED FOR IN THE “TERMS OF REFERENCE”**

In respect of any matters not provided for in this “Terms of reference”, the Steering Committee shall deal with the matters, and consider and make decisions with assistance of the Secretariat on a case-by-case basis.

## Appendix I List of Working Groups

<b>Working Group</b>	<b>Topic</b>
Network	MGM-Net, Ionospheric Observation
Precise Positioning	Precise Agriculture, Machine control
Disaster Mitigation and Management	Tsunami monitoring, land slide monitoring, GNSS meteorology
Intelligent Transportation System	Probe-car, Driver Behavior Monitoring, lane control, autonomous driving
Location Based Service	Mapping, Short Message, Personal Navigation
Capacity Building	Educational Program