Recommendation 1 for Committee Decision

Prepared by: **Working Group B: Enhancement of Performance of GNSS SErvices**

Date of Submission: 04/11/2015

Issue Title: Working Group-B Workplan Update

Background/Brief Description of the Issue:

The Workplan of Working Group-B was endorsed at ICG-6 in 2011. Since then important new areas of work were followed up by Working Group-B.

Discussion/Analyses:

Working Group-B reviewed its existing workplan taking into consideration the actual work conducted by the group and areas of interest to ICG. Based on this the group recommends an update of the workplan, that also allows to streamline the work and monitor its progress.

Recommendation of Committee Action:

Working Group-B recommends ICG to endorse its updated workplan, which centers around the following tasks:

1. Examine the problem of user position integrity and possible novel solutions to it.
2. Monitor techniques considered by application developers and external service providers for enhancement of GNSS performance.
3. Follow up the implementation of an interoperable GNSS Space Service Volume (SSV) and its evolution.
4. Examine the performance of atmospheric models to correct single frequency measurements.
5. Establish a dialogue with Space Weather/Remote Sensing community.

All tasks shall eventually lead to the identification of recommendations for GNSS Service Providers in order to enhance the GNSS performance for users, enable new services and capabilities. In addition the results of Working Group-B shall provide guidance to the GNSS user community to better exploit GNSS services and capabilities.

WG-B recommends to update its title to "Working Group on Enhancement of GNSS Performance, New Services and Capabilities" to better reflect its objective and scope of work.

While tasks 1, 2 and 4 are maintained from the Working Group-B workplan endorsed in 2011, the tasks 3 and 5 are new elements. As such Working Group-B enlarges its scope.

REVISED WORK PLAN
WORKING GROUP - Enhancement of GNSS Performance, New Services and Capabilities

As a unique combination of GNSS service providers and major user groups, the Working Group (WG) of the International Committee on Global Navigation Satellite Systems (ICG) will work to promote and coordinate activities aimed at enhancing Global Navigation Satellite Systems (GNSS) performance, recommending system enhancements that shall eventually lead to New Services and Capabilities at System Level to better serve the different GNSS user communities. Specifically, the following actions will be taken by the Working Group:

Task 1: Examine the problem of user position integrity and possible novel solutions to it. Recommend any required system enhancements or actions that contribute or are required for the implementation of novel integrity solutions to Service Providers.

Task 2: Monitor on a regular basis the techniques considered by application developers and external service providers for enhancement of GNSS performance in order to recommend any required system enhancements or actions that may support the realization of such techniques to Service Providers.

Task 3: Follow up the implementation of an interoperable GNSS Space Service Volume and provide recommendations to Service Providers regarding possible evolution needs arising from users/application developers.

Task 4: Examine the performance of atmospheric models to correct single frequency measurements and recommend models for implementation to Service Providers.

Task 5: Establish a dialogue with Space Weather/Remote Sensing community in order to identify how GNSS can better support the advancement of Space Weather/Remote Sensing products and vice versa.

In the execution of its tasks, WG-B shall also provide guidance to the GNSS user community to better exploit GNSS services and capabilities.

In addition to its annual Working Group session, at least one interim Working Group session (preferably in conjunction with an ICG Providers' Forum Meeting) will be called for in order to ensure progress on the different Working Group tasks. Additional interim Working Group sessions may be organized as needed.

The work in relation to Task 2 on the regular monitoring of application developer techniques and related needs is supported by the "Working Group Application Subgroup". The "Working Group Application Subgroup" objectives, tasks and procedures of work are specified in its Terms of Reference.

In the execution of its work, Working Group will coordinate its activities with all other Working Groups of the ICG..

Recommendation 2 for Committee Decision

Prepared by: **Working Group B: Enhancement of Performance of GNSS Services**

Date of Submission: **04/11/2015**

Issue Title: **Additional Co-Chair for Working Group**

Background/Brief Description of the Issue:

Working Group has important tasks to be carried out that are identified in the updated Workplan of the Group.

Discussion/Analyses:

A rising number of aspects shall be covered and addressed by Working Group. The implementation of endorsed ICG Working Group recommendations needs to be monitored. These aspects will lead to an increase of workload for the co-chairs and additional support is considered beneficial in order to ensure a smooth operation of Working Group.

Recommendation of Committee Action:

Working Group recommends to introduce a Third Co-chair in order to ensure a timely and successful follow up of the updated Workplan. A Third Co-chair will also help to ensure to conduct the necessary interim meetings of Working Group. Given the good work of the Working Group Application Subgroup and the active role of China in this Application Subgroup, Working Group recommends to appoint China as a Third Co-Chair of Working Group.

Recommendation 3 for Committee Decision

Prepared by: **Working Group B: Enhancement of Performance of GNSS Services**

Date of Submission: 04/11/2015

Issue Title: Utilization of GNSS satellites in Eccentric, Non-Nominal MEO Orbits

Background/Brief Description of the Issue:

Following the launch anomaly in August 2014 of two Galileo satellites, actions were put in place to stabilize the orbit and the satellites. The satellites are now occupying an eccentric orbit, which differs from the nominal orbits of GNSS Medium Earth Orbit (MEO) satellites. The satellites are transmitting Ranging Signals with good quality.

Discussion/Analyses:

Satellites in eccentric, non-nominal MEO orbits offer particular opportunities, that can be exploited e.g. for scientific studies of relativity, fast ambiguity fixing for Precise Point Positioning (PPP) users and enhancement of the interoperable GNSS Space Service Volume (SSV).

Recommendation of Committee Action:

ICG participants and scientific organizations are welcome to report to the Working Group on their experience utilizing satellites that are in eccentric, non-nominal MEO orbits in order to build a survey of these satellites for scientific research and Position, Velocity and Time (PVT) applications.