Recommendation 1 for Committee Decision

Prepared by: **Working Group B**

Date of Submission: **10 November 2016**

Issue Title: **Support to Space Service Volume (SSV) in Future Generation of Satellites**

Background/Brief Description of the Issue:

The importance of establishing an Interoperable GNSS Space Service Volume (SSV) is acknowledged by Space Agencies and Service Providers. Important progress has been made in establishing the interoperable GNSS SSV based on data that was released by the Service Providers.

Discussion/Analyses:

Service providers have been actively contributing to the completion of the SSV templates that include the support of the SSV of the different systems. Many GNSS provided data in the SSV template derived from measurement and characterization efforts conducted based on existing satellite designs.

Recommendation of Committee Action:

Service Providers, supported by Space Agencies and Research Institutions, are encouraged to define the necessary steps and to implement them in order to support SSV in future generation of satellites. Service Providers and Space Agencies are invited to report back to WG-B on their progress on a regular basis.

Recommendation 2 for Committee Decision

Prepared by: **Working Group B**

Date of Submission: **10 November 2016**

Issue Title: **GNSS Space User Database**

Background/Brief Description of the Issue:

The understanding of user needs is an essential element for any service implementation or service evolution. This in particular also applies to the case of the Space Service Volume as the user needs are highly depending on the specific space mission and the use case of the on-board GNSS receiver.

Discussion/Analyses:

The understanding of the user base is critical for the development of the Interoperable GNSS Space Service Volume. An exhaustive identification of space missions embarking a GNSS receiver is essential in order to ensure a comprehensive view on the mission needs and the use cases of the GNSS receiver.

Recommendation of Committee Action:

Service providers, supported by Space Agencies and Research Institutions, are encouraged to contribute to the existing IOAG database of GNSS space users. Contributions should be reported to WG-B, which should then contribute to the IOAG via the ICG-IOAG liaison.

The data included in the database should include the following:

Basic details:
- *Mission name & agency*
- *Actual or planned launch date*
- *Development phase (planned, in development, on-orbit, historical)*
- *Orbit regime (LEO, HEO, GEO, cis-lunar, etc.)*

GNSS usage:
- *GNSS constellations used*
- *GNSS signals used*
- *GNSS application (navigation, POD, time, radio occultation, etc.)*
- *Acquisition methods used (traditional, carrier phase)*
- *Solution method (point solution, filtered solution, etc.)*

Recommendation 3 for Committee Decision

Prepared by: **Working Group B**

Date of Submission: **10 November 2016**

Issue Title: **Additional Data for Space Service Volume**

Background/Brief Description of the Issue:

In order to exploit the Interoperable GNSS Space Service volume for space missions or to develop GNSS space receivers, information from the service providers regarding the power emissions for wide off-boresight angles are essential. Initial information on this aspect is available from every service provider.

Discussion/Analyses:

Recognizing the success of WG-B in encouraging all providers to provide SSV service details in templates for their constellations, GNSS space users now have the data necessary to determine if the SSV service is applicable to their needs.

Recommendation of Committee Action:

In order to fully support in-depth mission-specific navigation studies, WG-B invites the providers to consider for the future, to provide the following additional data if available:
- *GNSS transmit antenna gain patterns for each frequency, measured by antenna panel elevation angle at multiple azimuth cuts, at least to the extent provided in each constellation's SSV template.*

In the long term, also consider providing the following additional data (see also WG-D Recommendations):

- *GNSS transmit antenna phase center and group delay patterns for each frequency*