



ICG International Committee on
Global Navigation Satellite Systems

**ICG WORKING GROUP A
WORKSHOP ON GNSS INTEROPERABILITY
Global and Regional Navigation Satellite Systems and Satellite-based
Augmentations**

***HOLIDAY INN SURFERS PARADISE
22, View Avenue, 4217 Surfers Paradise, Australia***

FINAL AGENDA

DAY 1 – November 30

0830 Arrival, Registration, and Coffee

0900 Opening Remarks Working Group A Co-Chairs

09150 Review of the Workshop Agenda

0930-1115 SESSION 1 – GNSS Providers –

System Updates - System providers in attendance will very briefly present any new information since the September ICG meeting focused on interoperability issues and addressing the following system/service characteristics:

- A. Current and planned signals
- B. System time and geodetic reference frame standards
- C. Performance standards versus actual performance
- D. Services Provided and Provision Policies
- E. Timetable for system deployment and operation

Note: Presentations from ICG-4 can be viewed at the following site:

<http://www.oosa.unvienna.org/oosa/en/SAP/gnss/icg/icg04/presentations.html>

- 0930 China
- 0955 Japan
- 1020 Russian Federation
- 1040 United States
- 1100 Europe – Galileo Update provided by the EC and read by Matt Higgins

1115-1130 Break

1130-1300 SESSION 2a — GNSS Applications

Leaders from the receiver Industry, Academia or organizations representing users or producers will give brief summaries of their application sector with an emphasis on the importance of GNSS signal and service interoperability from their perspectives, taking into account:

- Presentations by system providers at ICG-4
- The ICG Providers Forum working definition of interoperability (see attachment);

1130 Will GNSS Interoperability affect RTK solutions – Yanming Feng, Queensland University of Technology, Australia

1150 GNSS interoperability from IGS perspective and the multi-GNSS demonstration campaign – Chris Rizos, University of New South Wales, Australia

1210 GNSS time interoperability: current status and plans – Arkadiy Tyulyakov, Russian Institute of Radionavigation and Time, Saint-Petersburg

1230 GNSS interoperability from the perspective of aircraft without on-board electrical generating systems – Bernald Smith, Commission on Airspace and Navigation, Federation Aeronatique Internationale

1300 Lunch

1400-1530 SESSION 2b — GNSS Applications (continued)*

1400 GNSS Research Activities – Gethin Roberts, University of Nottingham, United Kingdom

1420 WGS-84 Realization and related issues – Matt Higgins, FIG

1530-1730 SESSION 3 — Discussions on Selected Interoperability Topics

The Co-chairs of WG A will facilitate discussions with providers, industry, and user representatives focused on the use of multiple constellations and interoperability from their perspective. Possible topics of discussion include:

- Signal and system characteristics important to interoperability
- Time and geodesy aspects of GNSS interoperability and ground-based DGNSS interoperability
- Multi-GNSS demonstration campaign in Asia proposed by the Government of Japan
- Results of interoperability questionnaires completed to date

1730 ADJOURN

FOLLOW-ON DAYS — December 2 or 3 (as required)

SESSION 4 — Continued Workshop Discussions and Deliberations

Based on the presentations in Sessions 1 and 2, discussions in Session 3, and additional presentations and related information obtained during the iGNSS 2009 Conference, the Co-Chairs will facilitate further deliberations and share draft findings from the workshop with participants on the margins of the conference sessions.

ATTACHMENT*

* From the Report of the Third Meeting of the International Committee on Global Navigation Satellite Systems (ICG) Providers Forum

Providers Forum Working Principles of Compatibility and Interoperability and their Further Definition

Global and regional system providers agreed that at a minimum, all GNSS signals and services must be compatible. To the maximum extent possible, open signals and services should also be interoperable, in order to maximize benefit to all GNSS users. For many applications, common carrier frequencies are essential to interoperability, and commonality of other signal characteristics is desirable. In some cases, carrier frequency diversity may be preferable to improve performance. The Providers Forum will continue to investigate the benefits of carrier frequency commonality and diversity, as well as compatibility and interoperability, as these latter terms are defined below.

Interoperability refers to the ability of global and regional navigation satellite systems and augmentations and the services they provide to be used together to provide better capabilities at the user level than would be achieved by relying solely on the open signals of one system.

- Interoperability allows navigation with signals from different systems with minimal additional receiver cost or complexity.
- Multiple constellations broadcasting interoperable open signals will result in improved observed geometry, increasing end user accuracy everywhere and improving service availability in environments where satellite visibility is often obscured.
- Geodetic reference frames realization and system time steerage standards should adhere to existing international standards to the maximum extent practical.
- Any additional solutions to improve interoperability are encouraged.

Compatibility refers to the ability of global and regional navigation satellite systems and augmentations to be used separately or together without causing unacceptable interference and/or other harm to an individual system and/or service.

- The International Telecommunication Union (ITU) provides a framework for discussions on radiofrequency compatibility. Radiofrequency compatibility should involve thorough consideration of detailed technical factors, including effects on receiver noise floor and cross-correlation between interfering and desired signals.
- Compatibility should also respect spectral separation between each system's authorized service signals and other systems' signals. Recognizing that some signal overlap may be unavoidable, discussions among providers concerned will establish the framework for determining a mutually-acceptable solution.
- Any additional solutions to improve compatibility should be encouraged.