



International Committee on  
Global Navigation Satellite Systems

## **ICG WORKSHOP ON INTEROPERABILITY Global and Regional Navigation Satellite Systems and Satellite-based Augmentations**

**2-3 March 2008**

**Residenz Munchen ♦ Munich ♦ Germany**

### **PRELIMINARY AGENDA**

#### **DAY 1**

REGISTRATION & MORNING COFFEE

0830 – 0900

#### **OVERVIEW**

0900 – 0915 Opening Remarks – Working Group A Co-Chairs

0915 – 0930 Review of the Workshop Agenda

#### **SESSION 1– GNSS Providers**

0930 – 1100 Overview of Global and Regional Navigation Satellite Systems from Providers (China, EU, India, Japan, Russian Federation, United States)

All system providers will present brief reports\* on the technical characteristics of their systems and services provided to GNSS users, focusing on interoperability issues and 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 and background material based on updates of ICG-3 presentations should be made available to participants ahead of time to minimize the amount of time required for Provider presentations

COFFEE BREAK

1100 – 1130

### **SESSION 2 – GNSS Applications (1)**

1130 – 1300

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 the presentations made by system providers at ICG-3, and the ICG Providers Forum working definition of interoperability (attached).

LUNCH

1300-1415

### **SESSION 3 – GNSS Applications (2)**

1415 – 1530

Application and manufacturing presentations on interoperability from their perspectives will continue

AFTERNOON BREAK

1530 – 1600

### **SESSION 4 – Facilitated Discussion on Interoperability (1)**

1600 – 1730

The Co-chairs of WG A will facilitate a discussion between providers and users/producers on the identification and evaluation of various concepts and dimensions of interoperability as described by the presenters at the workshop. Specific feedback will be requested from industry and user community experts on issues such as:

- the value of common carrier frequencies and commonality of other signal characteristics to interoperability and performance;
- the possible preference for carrier frequency diversity by some applications in order to improve service performance;
- the impact of small carrier frequency shifts (up to 200 - 250 KHz for signals in common frequency bands) to the complexity of the receiver, and quality of signal processing and performance;

- the potential identification of multiple levels of interoperability (to include required amount of collaboration/integration required of multiple systems to enable multi-system equipment and its use);
- and, the development of quantitative or qualitative measures for determining levels of interoperability.

ADJOURN FOR THE EVENING

## **DAY 2**

MORNING COFFEE

0900 – 0930

### **SESSION 5 – Co-Chair Perspectives on Presentations and Discussions**

0930 – 1030

Based on the presentations in Sessions 1-3 and the discussions in Session 4, the Co-Chairs will present their initial findings on Interoperability for discussion and potential revision

COFFEE BREAK

1030 – 1100

### **SESSION 6 – Discussion and Development of Workshop Conclusions**

1100 – 1330

The Co-chairs of WG-A will facilitate the development of conclusions resulting from the content of the workshop's presentations and subsequent participant deliberations. These conclusions will be further discussed and refined during a follow-on workshop to be conducted prior to the 4<sup>th</sup> meeting of the ICG in Saint-Petersburg, Russia, September 14-18, 2009.

## **ADJOURN**

\* Note: The opening Plenary session of the Munich Satellite Navigation Summit 2009 will begin in the evening.

## 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.