



International Committee on
Global Navigation Satellite Systems

Fourth Meeting of the International Committee on Global Navigation Satellite Systems (ICG)

Federal Space Agency (Roscosmos)

**Saint-Petersburg, Russian Federation
14 – 18 September 2009**

PROVISIONAL AGENDA

Sunday, September 13

- 16:00 – 18:00 **Registration** (*Sokos Hotel*)
- 16:00 – 17:00 **Meeting with the Working Groups Chairs** (*Jazz room*)
- 17:00 – 18:00 **Providers' Forum Meeting** (*Jazz room*)

Monday, September 14

- 08:00 **On-site Registration**
- 09:00 **FIRST PLENARY SESSION OF THE ICG**
- Attended by all. The primary purpose is for Providers to present the status and future plans for their systems, and for associate members and observers to also provide updates. All presenters will identify issues for discussion in the ICG and/or Working Groups*
Large Auditorium (Waltz room)
- 09:00 **Welcome/Opening Remarks**
- Mr. Anatoliy SHILOV, Deputy Head of the Federal Space Agency (Roscosmos), ICG-4 Chair*
- Mr. Hans HAUBOLD, Office for Outer Space Affairs, United Nations Office at Vienna*
- 09:30 – 09:40 **Adoption of Agenda**
- 09:40 – 10:10 *Coffee Break/Group Photo*

10:10 – 12:30 **Providers System and Service Updates**

- 10:10 Global Navigation Satellite System (GLONASS) and System of Differential Correction and Monitoring (SDCM), *Mr. Sergey REVNIVYKH, Russian Federation*
- 10:35 U.S. Space-based Positioning, Navigation and Timing Policy and Programme Update, *Mr. Robert HESSIN, NCO for Space-Based PNT, Mr. David BUCKMAN, AFSPC, and Mr. Leo ELDRIDGE, DoT/FAA, United States of America*
- 11:00 The European GNSS Programmes: EGNOS and GALILEO, *Mr. Edgar THIELMANN, European Commission*
- 11:25 COMPASS/BeiDou Navigation Satellite System Development, *Mr. Qiangwen YANG, China Navigation Satellite Project Centre, China*

Regional Providers Updates

- 11:50 Current Status of the Quasi-Zenith Satellite System, *Mr. Koji TERADA, Japan Aerospace Exploration Agency (JAXA), Japan*
- Overview of MSAS (MTSAT Satellite-based Augmentation System, *Office of Aeronautical Satellite Systems, ATS Engineering Division, Japan Civil Aviation Bureau*

- 12:40 **Announcement for the Fifth Meeting of the ICG**
Mr. Mario Caporale, Italy

- 12:50 – 13:10 *Coffee Break*

13:10 – 14:00 **Presentations by Associate Members and Observers on Matters of Interest to ICG**

Attended by all. Opportunity for Associate Members and Observers to present recent developments in their organizations and associations with regard to GNSS services and applications
Large Auditorium (Waltz room)

- 13:10 GNSS Programme: Education and Capacity Building in the Use of GNSS Technologies, *Ms. Sharafat GADIMOVA, Office for Outer Space Affairs*
- 13:20 System Information Exchange: A Provider's Responsibility, *Mr. Rick HAMILTON, Civil GPS Service Interface Committee*
- 13:30 EUPOS Brief Status Report, *Mr. Gerd ROSENTHAL, European Position Determination System*
- 13:40 The Role of Positioning Infrastructure in Supporting the Millennium Development Goals, *Mr. Matt HIGGINS, International Federation of Surveyors*

- 13:50 BIPM actions and developments related with GNSS, *Mr. Wlodek LEWANDOWSKI, International Bureau of Weights and Measures*
- 14:00 – 15:00 *Lunch*
- 15:00 **GNSS SCIENCE AND TECHNOLOGY APPLICATIONS**
- Attended by all. The primary purpose is for participants or invited presenters to raise awareness of issues and/or opportunities in user applications and GNSS technology for consideration by the ICG and/or Working Groups
Large Auditorium (Waltz room)*
- 15:00 -16:30 **Science and Innovative Applications**
- 15:00 Review of Navigation Systems by the Russian Manufacturers, Trends and Prospects, *Mr. Valery BABAKOV, Design-engineering department NAVIS Corp., Russian Federation*
- 15:15 The Basic Directions of Application of Satellite Navigation on Aircraft of Civil Aviation, *Mr. A. STULOV, State Research Institute “Aeronavigation”, Russian Federation*
- 15:30 Maritime Navigation Systems, *Mr. A. ROGOV, “TRANZAS” Corp., Russian Federation*
- 15:45 Meeting Space User Requirements through Evolving PNT services, *Larry YOUNG, NASA-JPL, United States of America*
- 16:00 COMPASS Innovative Application, *Mr. Yuanxi YANG, China National Administration of GNSS and Applications, China*
- 16:15 Regional GLONASS-enabled Navigation and Data System for Transport Industry, *Mr. B. POLTORAZKIY, “M2M Telematics” Co. Ltd., Russian Federation*
- 16:30 – 16:45 *Coffee Break*
- 16:45 – 17:30 **Science and Innovative Applications (continues)**
- 16:45 European GNSS Evolutions Programme, *Mr. Rafael LUCAS RODRIGUEZ, European Space Agency*
- 17:00 Specific Applications of GLONASS/GPS System for Various Areas, *Mr. Ivan NECHAYEV, “RNT” Corp., Russian Federation*
- 17:15 Priority Areas of the Use of the GLONASS Technology in the Railroad System, *Mr. N. SAZONOV, “NIIAS” Corp., Russian Federation*
- 17:30 GLONASS Technology Application for Mining Transport Dispatching, *Mr. Dmitry VLADIMIROV, “VIST Group” Co. Ltd., Russian Federation*

17:45 Towards a Multi-Constellation GNSS in Aviation, *Mr. Francisco SALABERT, EUROCONTROL*

 Anthropogenic Greenhouse Gas Reduction Using GNSS, *Mr. Jeff HAMILTON, Director, Strategic Partnerships, Trimble*

18:00 Adjourn

19:00 Welcoming Reception

Tuesday, September 15

09:00 – 11:00 **FIRST SESSION OF PROVIDERS' FORUM**

Attended by only the providers.

Large Auditorium (Waltz room)

11:00 – 11:30 *Coffee Break*

WORKING GROUP MEETINGS

11:30 – 17:30 **WG A – Compatibility and Interoperability**

Large Auditorium (Waltz room)

Co-Chairs: Mr. Sergey REVNIVYKH, Russian Federation and Mr. David TURNER, United States of America

11:30 – 13:00 **Working Group Member Presentations on Interoperability and related topics**

 Template for GNSS service performance commitments, *Mr. Karl KOVACH, GPS Wing/Aerospace, USA*

 SVN-49/PRN-01: Lessons Learned, *Mr. David GOLDSTEIN, GPS Wing, USA*

 GLONASS view on compatibility and interoperability, *Mr. Grigory STUPAK, Institute of Space Device Engineering, Russian Federation*

 Galileo View on Compatibility, Interoperability and Performance Standard, *Mr. Frederic BASTIDE, European Commission*

 Proposal for Multi-GNSS Demonstration Campaign, *Mr. Satoshi KOGURE, Japan Aerospace Exploration Agency (JAXA), Japan*

 Views on Compatibility and Interoperability, *Ms. Jun LU, China Satellite Navigation Project Centre*

Additional Presentations

13:00 - 14:00

Lunch

14:00 – 17:30

WG A – Compatibility and Interoperability (continues).

Co-chairs Presentation and Group Discussions

Report on 2009 Activities

- Interoperability Questionnaire
- Workshop and Meeting
- Report Findings and Recommendations

Principal and Definition of Interoperability

Recommendations for Committee Consideration

Status of workplan and actions

2010 Work Plan

14:00 – 17:30

(in parallel) WG C – Information Dissemination

Jazz room

Co-Chairs: Mr. Hans HAUBOLD and Ms. Sharafat GADIMOVA, United Nations Office for Outer Space Affairs

14:00

Opening remarks, *Ms. S. Gadimova and Mr. H. Haubold, UNOOSA*

14:05

Russian Experience in Satellite Navigation Distance Learning: International Cooperation, *Ms. I. BRINDIKOVA, Russian Institute of Space Device Engineering, Russian Federation*

14:15

Experience in Preparations and Improvements of Professional Skill of Specialists in the Bauman Moscow State Technical University, *Mr. A. SHUMOV, BMSTU, Russian Federation*

14:25

Public Organizations' Activity with Potential GNSS Users, *Mr. V. KLIMOV, Association "GLONASS/GNSS Forum", Russian Federation*

14:35

The Reshetnev Siberian State Aerospace University, *Mr. G.P. BELYAKOV, Siberian State Aerospace University named after academician M.F. Reshetnev, Russian Federation*

14:45

GNSS Activities of the United Nations- affiliated Regional Centres for Space Science and Technology Education, *Mr. Joseph AKINYEDE, ARCSSTE, Nigeria, Mr. Abderrahmane TOUZANI, Morocco, Mr. Sergio CAMACHO, Mexico*

- 14:55 Educational Tools for GNSS, *Prof. Letizia LO PRESTI, Politecnico di Torino, Italy*
- 15:10 YGNSS Activities, *Ms. Stephanie WAN, SGAC*
- 15:20 Working Group Discussion of 2009 Work Plan (draft report)
- 16:00 – 16:20 *Coffee Break*
- (in parallel) WG C – Information Dissemination (continues)**
- Jazz room*
- 16:20 Working Group Discussion of the Work Plan for 2010 – 2012
- 17:30 Adjourn

Wednesday, September 16

WORKING GROUP MEETINGS (continues)

- 09:00 – 13:00 **WG D – Interactions with National, Regional Authorities and International Organizations**
- Large Auditorium (Waltz room)*
- Co-Chairs: Mr. Matt HIGGINS, Fédération internationale des géomètres (FIG), Ms. Ruth NEILAN, International Association of Geodesy (IAG) and Mr. John DOW, International GNSS Service (IGS)*
- 09:00 – 11:00 **Task Force on Geodetic References**
- 09:00 – 09:05 Introduction by co-chairs: Objectives of Task Force, *Mr. John M. DOW, Mr. Matt HIGGINS*
- 09:05 – 09:15 The International Terrestrial Reference System (ITRS) as a global standard, *Mr. Claude BOUCHER, IAG, France*
- 09:15 – 09:30 The International Terrestrial Reference Frame (ITRF), *Mr. Zuheir ALTAMIMI, IGN/IERS, France*
- Presentations on provider system geodetic references (GPS, GLONASS, Galileo, COMPASS)**
- 09:30 – 09:45 GPS Geodetic Reference System WGS 84, *Ms. Barbara WILEY, National Geospatial-Intelligence Agency, USA*
- 09:45 – 10:00 Russian National Geodetic Reference System Update, *Mr. Gleb DEMYANOV, Research Institute of Geodesy, Aerial Photography and Mapping, Russian Federation*

- 10:00 – 10:15 Galileo Geodetic Service Provider: Approach to the Galileo Geodetic Reference Frame (GTRF), *Mr. Zuheir ALTAMIMI, on behalf of the GGSP Consortium*
- 10:15 – 10:30 CGCS 2000, *Dr. Yang YUANXI, CNSA, China*
- 10:30 – 10:40 About Compliance of “GLONASS” S/C Retroreflectors System with the Requirements of International Laser Ranging Service Standards, *Mr. Viktor SHARGORODSKY, Research Institute of Precision Device Engineering, Russian Federation*
- 10:40 – 11:00 Discussion and conclusions
- 11:00 – 11:30 *Coffee Break*

WG D – Interactions with National, Regional Authorities and International Organizations (continues)

Task Force on Time References

- 11:30 – 11:35 Introduction by co-chairs: Objectives of Task Force, *Ms. Felicitas ARIAS, Mr. Włodzimierz LEWANDOWSKI*
- 11:35 – 11:40 Fundamentals on UTC - Relationship between GNSS Times, *Ms. Felicitas Arias, Mr. Włodzimierz Lewandowski, BIPM*
- 11:40 – 11:55 GPS Time and its Steering to UTC(USNO), *Mr. Ed POWERS, to be confirmed*
- 11:55 – 12:10 The State Service for Time and Frequency and GLONASS Fundamental Ensuring Means, *Mr. Nicolay KOSHELYAEVSKY, Research Institute of Physic-Technical and Radio-Technical Measurement, Russian Federation*
- 12:10 – 12:25 The Definition and Implementation of Galileo System Time, *Mr. J. DELPORTE, CNES, France*
- 12:25 – 12:30 IRNSS/GAGAN Timing Infrastructure in India, *Mr. Włodzimierz LEWANDOWSKI on behalf of Suresh KIBE, ISRO, India*
- 12:30 – 12:50 Discussion and conclusions
- 12:50 – 12:55 QZSS Joint Demonstration Campaign – Proposal, *Mr. Satoshi KOGURE, JAXA, Japan*
- 12:55 – 13:00 Comments on WG-D Work Plan
- 13:00 – 14:00 *Lunch*

14:00 – 17:30

WG B – Enhancement of Performance of GNSS Services.

Jazz room

Co-Chairs: Mr. Rafael Lucas RODRIGUEZ, European Space Agency and Mr. Suresh KIBE, India

Presentations

Intellectual Geoinformation Complex for the Mobile Resources Management Using GLONASS, *Mr. A.B. STEPANOV, “Teleprovodnik” Ltd. Co., Russian Federation*

GLONASS/GPS Receivers for Improving GNSS Services and their Application for Transportation Development, *Mr. V.V. PUCHKOV, “GeoStar Navigation” and Mr. Ye. A. BELYANKO, “M2M Telematika”Ltd. Co., Russian Federation*

The Use of A-GNSS Technology for Improving the GNSS Services, *Mr. Sergey REVNIVYKH, Russian Federation*

New Multipath Detection and Mitigation Techniques, *Jose Angel Avila Rodriguez, Stefan Wallner, Matteo Paonni, Thomas Kraus, Bernd Eisfeller, Institute of Geodesy and Navigation, University FAF Munich, Germany*

Discussion topics

Use of advanced modulation techniques to minimize multipath errors

Advanced techniques for multipath mitigation in GNSS user receivers

Selection of ranging codes to improve tracking and acquisition performance of receivers for indoor positioning

Advances in LDPC CC and its use in GNSS

Extension of GNSS accuracies through use of terrestrial systems such as, FM, OFDM and evolving technologies for Broadband Wireless Access such as, Wi-Fi and WiMAX

Integration of GNSS and terrestrial mobile phones and internet wireless technology experiments such as SISNeT

Real time GIS visualization on mobile and user terminal and integration of timing service on mobile phones

Redundant and parallel terrestrial satellite based technologies

16:00 – 16:20

Coffee Break

17:30

Adjourn

Thursday, September 17

09:00 – 10:00 **SECOND SESSION OF PROVIDERS' FORUM**

Attended by only the providers.

Large Auditorium (Waltz room)

10:00 – 12:30 **SECOND PLENARY SESSION OF THE ICG**

Attended by all. The primary purpose is for Working Groups to present results of their meetings or any meetings held since the Third Meeting of the ICG. Presentations will include any draft recommendations to the ICG.

Large Auditorium (Waltz room)

10:00 -10:30 **Presentation by WG A and Discussion**

10:30 – 11:00 **Presentation by WG B and Discussion**

11:00 – 11:30 *Coffee Break*

11:30 – 12:00 **Presentation by WG C and Discussion**

12:00 – 12:30 **Presentation by WG D and Discussion**

12:30 – 13:30 *Lunch*

14:00 – 19:00 *Area Tours*

20:00 – 22:00 *Neva river boat reception*

Friday, September 18

09:00 – 13:00 **THIRD PLENARY SESSION OF THE ICG**

Attended by all. The primary purpose is to consider final recommendations as considered by the Providers' Forum. This session will also consider other ICG-related issues.

Large Auditorium (Waltz room)

09:00 **Opening remarks**

09:15 **Consideration of proposed ICG recommendations**

10:30 *Coffee Break*

11:00 **Other matters**

11:30 **Review and approval of meeting conclusions (joint statement, press release, etc.)**

12:00 **Proposals for Meetings of the ICG in 2011 and 2012**

12:30 **Closing Statements**

13:00 **Adjourn**