

International Committee on Global Navigation Satellite Systems (ICG): A System of Systems

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Outline

- I. United Nations Office for Outer Space Affairs (UNOOSA)**
- II. UNISPACE III: Action Team on Global Navigation Satellite Systems**
- III. International Committee on Global Navigation Satellite Systems (ICG)**
- IV. Programme on GNSS Applications: Information Dissemination and Capacity Building**
- V. ICG Executive Secretariat**

United Nations Office for Outer Space Affairs (UNOOSA)

- **Mandated by the Fourth Committee of the UN General Assembly (UN GA) and the Committee on the Peaceful Uses of Outer Space (UN COPUOS) and its subsidiary bodies:**
 - **Scientific and Technical Subcommittee and**
 - **Legal Subcommittee**
- **UN COPUOS reports annually to the Fourth Committee of the UN GA, which annually adopts a **GA resolution on****
“International cooperation in the peaceful uses of outer space”

UNISPACE III

- Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), July, 1999:
 - “The Space Millennium: Vienna Declaration on Space and Human Development”
 - Recommendation concerning Global Navigation Satellite Systems (GNSS):

...to improve the efficiency and security of transport, search and rescue, geodesy and other activities by promoting the enhancement of, universal access to and compatibility of space-based navigation and positioning systems

UNISPACE III: Action Team on Global Navigation Satellite Systems (GNSS)

- 12 Action Teams established by UN COPUOS under voluntary leadership by Member States
 - *Recommendations that have been assigned highest priority by Member States of the United Nations*
- **GNSS Action Team** co-chaired by the United States and Italy
 - Membership: 38 nations & 15 organizations
 - Working Groups on 5 thematic areas:
 - *Surveying, mapping, and Earth science*
 - *Agriculture and management of natural resources*
 - *Environmental monitoring and management*
 - *Transportation*
 - *Education and training, awareness increase*



UNISPACE III: Action Team on Global Navigation Satellite Systems (GNSS)

UN OOSA: 2001 – 2002: Regional Workshops

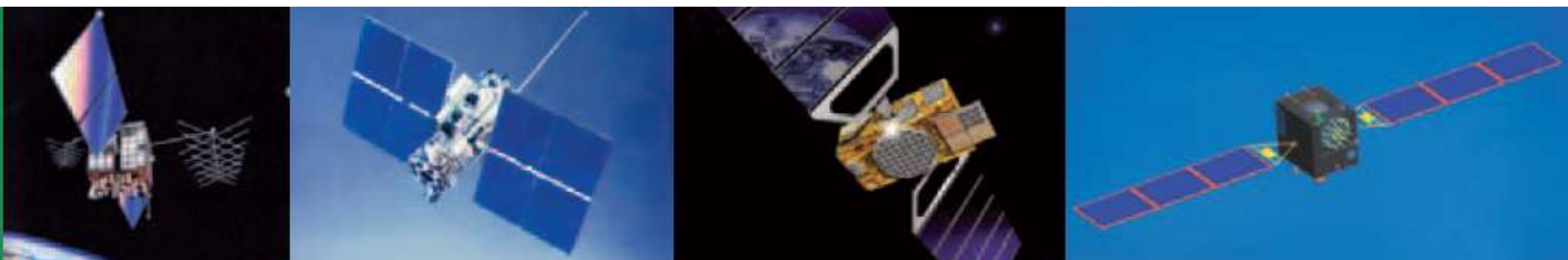
- **Malaysia:** Economic and Social Commission for Asia and the Pacific (ESCAP)
 - **Austria:** Economic Commission for Europe (ECE)
 - **Chile:** Economic Commission for Latin America and the Caribbean (ECLAC)
 - **Zambia:** Economic Commission for Africa (ECA)
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- **2002 – 2004:** International Meetings, Vienna
 - **2004:** Action Team concluded its work

International Committee on Global Navigation Satellite Systems (ICG)

A forum to discuss Global Navigation Satellite Systems (GNSS) to benefit people around the world

- **2005: Establishment of ICG**
 - **ICG Membership: Members, Associate Members and Observers**
 - *9 nations & the European Commission*
 - *15 organizations (UN system entities, IGOs, NGOs)*

ICG participation is open to all countries and entities that are either GNSS providers or users of GNSS services, and are interested and willing to actively engage in ICG activities



International Committee on Global Navigation Satellite Systems (ICG)

2006: First Meeting of the ICG, UNOV, Vienna, Austria

- **Work plan**
 - **Compatibility and Interoperability (USA and Russian Federation)**
 - **Enhancement of performance of GNSS services (India and ESA)**
 - **Information dissemination (UN OOSA)**
 - **Interaction with international organizations, national, and regional authorities (IAG, IGS, FIG)**

□ **2007: Second Meeting of the ICG, ISRO, Bangalore, India**

- **Within the ICG is the Providers' Forum, consisting of those countries operating GNSS systems or with plans to develop one. The Forum provides a venue for coordination and cooperation to improve overall service provision**
- **Providers' Forum: U.S., Russian Federation, European Community, China, India, Japan**

International Committee on Global Navigation Satellite Systems (ICG)

- **2008: Third Meeting of the ICG, JPL, Pasadena, USA**
 - **Providers' Forum adopted its ToR and Workplan**
 - Focused discussions on **compatibility and interoperability**
 - Exchange detailed information on systems/service provision plans
 - Exchange views on ICG work plan and activities
 - **UN-affiliated Regional Centres for Space Science and Technology Education (India, Morocco, Nigeria, Mexico/Brazil) will act as the ICG Information Centres**
 - **Task Forces on Geodetic References and on Time References**

International Committee on Global Navigation Satellite Systems (ICG):

A System of Systems

interoperability — ability of global and regional systems and their services to be used together to provide better capabilities at the user level than would be achieved by relying on one system

compatibility – ability of global and regional systems to be used separately or together without causing unacceptable interference and/or other harm to an individual system

International Committee on Global Navigation Satellite Systems (ICG)

2009: Fourth Meeting of the ICG, Roscosmos, Saint-Petersburg, Russian Federation

- ▣ **Further development of ICG and Providers' Forum workplan:**
 - ▣ **Further elaboration and implementation of the principle of compatibility and interoperability;**
 - ▣ **Monitor the ionosphere during the next solar maximum and its effects on GNSS receivers;**
 - ▣ **Adopted new principle on transparency: Every provider should publish documentation that describes signal and system information, policies of provision and minimum levels of performance for its open services;**
 - ▣ **Task Forces to align and maintain geodetic and timing references to enhance interoperability for the user**

2010:

***Italy and European Commission to jointly host
the Fifth meeting of the ICG***

Programme on GNSS Applications: Information Dissemination and Capacity Building

I. International Space Weather Initiative

- *Aspects of the response of the mid- and low-latitude ionosphere to magnetic storms and their space weather effects, including in-situ and ground-based observations as well as modelling and theoretical studies, particularly using GPS*
- *To complement the ground based data, huge amounts of data from space based missions on Earth and heliospheric phenomena, which are freely accessible, and the analysis and interpretation of this data will be carried out*
- **AWESOME (Atmospheric Weather Educational System for Observation and Modeling of Effects)/SIDs (Sudden Ionospheric Disturbance) monitors, USA**
- **Workshop to Establish Scientific and Instrument Collaborations for Observing the Consequences of Space Weather from Morocco, 19 – 20 November 2009, Rabat, Morocco, Universite Mohammed V- Souissi**
- **The Académie Hassan II des Sciences et Techniques, and the Secretariat of the International Space Weather Initiative**
 - *The development of distributed ionospheric observatories, which began during the International Heliophysical Year (IHY), is continuing in the new United Nations program, the International Space Weather Initiative (ISWI)*
 - *To establish scientific partnerships between instrument providers and researchers from the universities of Morocco*
- **UN/ESA/JAXA/NASA Workshop on International Space Weather Initiative (ISWI), Luxor, Egypt, 6 – 10 November, 2010**

Programme on GNSS Applications: Information Dissemination and Capacity Building

II. Regional Workshops on the Applications of GNSS

- **UN/Azerbaijan/USA/ESA Workshop on the Applications of GNSS, 11 – 15 May 2009, Baku, Azerbaijan**
 - *GNSS technology: Practical applications and scientific exploration perspective*
 - *Land-based and marine applications*
 - *Space weather monitoring*
 - *Regional Reference Frame: EUPOS/EUREF*

- **UN/Moldova Workshop on GNSS, 17 – 21 May 2010, Chishinau, Moldova**

Programme on GNSS Applications: Information Dissemination and Capacity Building

III. Training for capacity building in developing countries

- **UN/ESA/USA Training Course on Satellite Navigation and Location Based Services, at the African Centre for Space Science and Technology – in French language (CRASTE- LF), 28 September – 24 October 2009, Rabat, Morocco**
- **UN/USA Training Course on Satellite Navigation and Location Based Services, at the Regional Centre for Space Science and Technology Education in Latin America and the Caribbean (CRECTEALC), Puebla, Mexico, 23 – 27 November 2009**
 - *Further development of the GNSS Education Curriculum*
 - *ICG Information Centre: To foster a more structured approach to information exchange in order to fulfill the reciprocal expectations of a network between ICG and Regional Centres*
- **UN/Italy Long Term Fellowship Programme on GNSS and Related Applications, Master in GNSS and Related Applications (MNA), Politecnico di Torino, Italy**
- **UN Training Course on Satellite Navigation and Location Based Services, at the African Regional Centre for Space Science and Technology Education in English language (ARCSSTE-E), Ile-Ife, Nigeria, October 2010**

Programme on GNSS Applications: Information Dissemination and Capacity Building

IV. Promoting the use of GNSS technologies as tools for scientific applications

- **Satellite Navigation Science and Technology for Africa, 23 March – 09 April 2009, the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy**
- *“Geo-science” instruments in Africa (GPS Africa): African Array, AFREF, IHY projects, atmospheric monitoring of water vapor, space weather observations*
 - *Standards, communication of data policies to maximize the benefits of the networks*
- **Establishment of GNSS Permanent Stations and Data Processing Course, 24 August – 4 September 2009, Regional Centre for Mapping of Resources for Development (RCMRD), Nairobi, Kenya**
 - **AFREF: unified geodetic reference frame (“one sky Africa”) for the national and regional 3-D ref. networks consistent with ITRF**
- **Satellite Navigation Science and Technology for Africa, 6 – 23 April 2010, the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy**

V. UNOOSA: ICG Executive Secretariat

...to enhance the utilization of existing and planned opportunities

International Committee on Global Navigation Satellite Systems provides...

- **web-based information**
- **information brochures**
- **technical workshops and expert meetings**
- **promoting the use of GNSS technologies as tools for scientific applications**



Following the [Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space \(UNISPACE III\)](#), held in 1978, in its resolution 54/68, the United Nations General Assembly endorsed the "Vienna Declaration: Space Millennium for Human Development". The Vienna Declaration called for action, among other matters, to improve the efficiency and security of transport, search and rescue, geodesy and other activities by promoting the enhancement of, universal access to and compatibility of, space-based navigation and positioning systems. In response to that call, in 2001 the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) established the Action Team on Global Navigation Satellite Systems (GNSS) to carry out those actions under the chairmanship of Italy and the United States of America. The Action Team on GNSS, consisting of 38 member States and 15 inter-governmental and non-governmental organizations, recommended, among other things, that an International Committee on GNSS (ICG) should be established to promote the use of GNSS infrastructure on a global basis and to facilitate exchange of information. The Committee included this recommendation in the Plan of Action proposed in its report to the

International Committee on Global Navigation Satellite Systems is also...

- **open for collaboration and cooperation**
- **would welcome your participation in and contribution to the ICG activities**

**Secretariat of the
International Committee on
Global Navigation Satellite Systems**

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