

Reference Frame in Practice Technical Seminar
4-5 May 2012 Rome Italy



The IAG, (International Association of Geodesy), FIG and ICG (International Committee on GNSS) held a technical seminar prior to the Working Week, on 4-5 May 2012. This event was held at the Cassa Geometri (Cassa Italiana Di Previdenza Ed Assistenza Dei Geometri Liberi Professionisti). 42 delegates were present on both days to listen and discuss presentations on -

- The Role of Geodesy-GGOS and Future Trends by Prof. Chris Rizos President IAG
– This presentation provided an overview of the transition from traditional to modern geodesy, describing the evolution of roles, impact of services, central importance of reference frame definition, contributions to geoscience and GGOS.



- Global Terrestrial Reference Systems and Frames by Dr Zuheir Altamimi, who discussed theory relating to ITRS / ITRF / WGS-84; associated transformations; how ITRF is determined; and how geodetic techniques (VLBI, GNSS, DORIS, SLR) contribute to ITRF.



- Regional and National reference systems by Eng. Joao Torres and Dr John Dawson. This session described the mathematical relationship between the ITRF and regional or national reference frames using EUREF and APREF as case studies. The topics covered included the definition, realisations, GNSS CORS infrastructure and campaigns, transformations, and monitoring of such regional reference frames.
- Worked examples of Terrestrial Reference Frame Realisations by Dr John Dawson, Prof Volker Schwieger, and Mr Nic Donnelly. In this session delegates were provided additional case studies from countries describing how their geodetic datum has been realised in relationship to a regional reference frame or ITRF and

any local problems and issues. It also included the discussion of issues for an intra-plate country as opposed to one across a plate boundary.



- IGS Services and Other Initiatives by Ms Ruth Neilan. In this presentation, an overview on how these services and other initiatives contribute to global reference systems; regional and national reference systems; organisational benefits; and how do agencies participate i.e. requirements was provided.
- Gravity and WHS by Dr Dan Roman. In this session, the presenter focused on the relationship between various aspects of the Earth's gravity field such as the geoid, geopotentials, gravity, deflections of the vertical, and physical heights (e.g., above mean sea level). It also covered the different means of observing the gravity field and how they are combined to produce models for height determination both at global scales, such as the World Height System, and locally for National Vertical Datums.



- Multi GNSS Environment by Ms Sharafat Gadimova, Dr Lawrence Lau, and Mr Larry Hothem. The presenters provided an overview of the ICG work plan, its activities, and the Providers Forum. There were also presentations on the 'state of play' and 'emerging issues' relating to a multi GNSS environment. This included information relating to signals, augmentation and space; the technical effects of a multi GNSS environment on reference frame infrastructure, positioning applications and techniques.
- Standards and Traceability of a Terrestrial Reference Frame / GNSS by Dr David Martin and Mr Larry Hothem. This session provided an overview of the standards, best practice and traceability respect to reference frames, GNSS measurements, GUM, the ISO 9000 series of standards, the ISO 17123 series and TC211. It also included the status of Geodetic Network Registry.



- Four dimensional deformation models for Terrestrial Reference Frames by Mr Graeme Blick and Mr Richard Stanaway. The presentations examined the concepts of 4 dimensional datums; the pros and cons of static, semi-dynamic datum and dynamic datums; and the development of Deformation Models which incorporate the effects of events such as earthquakes. The information was explained through case studies from Australia and New Zealand.



The organizers of this seminar would like to thank Cassa Geometri, Trimble Navigation, ESRI and the hosts CNGeGL for their support and assistance to make this event a success. We would also like to thank UNOOSA (United Nations Office for Outer Space Affairs) for their generosity as they sponsored 4 delegates to attend this seminar.