

**COMMISSION 5  
POSITIONING AND MEASUREMENT  
WORK PLAN 2002 – 2006**

**1. Title**

Positioning and Measurement.

**2. Terms of Reference**

- The science of measurement (instrumentation, methodology and guidelines)
- The acquisition of accurate and reliable survey data related to the position, size and shape of natural and artificial features of the earth and its environment and including variation with time.

**3. Mission statement**

- Focus on modern technologies and technical developments and assist individual surveyors, through guidelines and recommendations, to choose and utilise those methods, technologies and instruments that are most appropriate to different applications.
- Follow technical developments through collaboration with other FIG commissions and other international organisations; participation in appropriate meetings; and the preparation of appropriate publications.
- Support research and development and stimulate new ideas in the fields of expertise represented within the commission.
- Collaborate with manufacturers on the improvement of instrumentation and associated software.
- Present and promote the work of the commission and its working groups on an on-going basis at FIG working weeks and other relevant technical meetings and in appropriate FIG and other media.

**4. General**

This work plan covers the development, use and integration of technologies for positioning and measurement and the associated standardisation, best practice and fundamental reference frame issues. Many of the issues are global in nature and Commission 5, working with like-minded Sister Associations, is well placed to deal with them. FIG Council has also asked the Commissions to cooperate with United Nations Agencies to address global problems such as sustainable development and humanitarian needs. The disciplines covered by Commission 5 are at the heart of delivering solutions for the spatial aspects of these important global problems. Specific activities aimed at developing countries include examination of Low Cost Surveying Technologies and contribution to appropriate Continuing Professional Development programs.

## **5. Working Groups**

### **WG 5.1 – Standards, Quality Assurance and Calibration**

#### Policy Issues

- Influence the development of standards affecting positioning and measurement instruments and methods, in collaboration with the FIG task force on standards and through participation in the relevant technical committees (TCs) of the International Standards Organisation (ISO) and other appropriate bodies.
- Acceptance controls, quality assurance and certification and their impact on the surveying profession.
- Checking and calibration of measuring instruments.
- Assist other Commission Working Groups to implement Standards from ISO TC211 as appropriate.

#### Chair

- Rudolf Staiger (Germany), e-mail: rudolf.staiger@uni-essen.de.

#### Specific project(s)

- Present and promote the use of standards and guidelines to the surveying community.
- Establish guidelines and recommendations for the checking and determination of field accuracy of total stations, digital levels, laser planes, etc and for their calibration, including lab calibration.
- Review the situation with GPS/GNSS in relation to Standards, Quality Assurance and Calibration.
- Develop guidelines and recommendations relating to the ISO Guide to Uncertainty of Measurements.
- Review Standards coming from ISO TC211 for relevance to Positioning and Measurement.
- Represent Commission 5 on the FIG Standards Network (led by Commission 1).

#### Workshop(s)

- Participation in FIG Working Weeks and other major Commission events (see events section below) with dedicated Technical Sessions and/or Workshops as appropriate.
- Participation in appropriate events of Sister Associations, ISO etc related to Standards, Quality Assurance and Calibration.

#### Publication(s)

- FIG Working Weeks will include Technical Papers on specific issues and presented by Working Group Members and other invited experts.
- Continue publication of the series of Guidelines on Surveying Instruments; including publication on the Commission web page.
- Working group final report will be presented at FIG Congress, 2006.

### Timetable

- Draft publications will be presented at FIG Working Weeks during the term of this plan and according to a timetable to be developed by the Working Group Chair.
- Working group final report: dedicated session, FIG Congress, 2006.

### Beneficiaries

- FIG member associations, manufacturers and users of survey equipment, governments, standardisation organisations, decision makers, GIS developers and users, surveying businesses, individual surveyors.

## **Working Group 5.2 – Reference Frame in Practice**

### Policy issues

Policy Issues include the following:

- Work to bring together all organisations involved in defining or using reference frames to develop common approaches and avoid duplication. Such organisations include FIG, IAG, ISO, groups of national mapping agencies, other influential national agencies (such as the US DoD's NIMA) and alliances of commercial organisations (such as Open GIS Consortium and the European Petroleum Survey Group).
- Provide background technical information on relevant issues written in a way that is accessible to the surveying practitioners.
- Develop an inventory of approaches to reference frame issues in different countries (including transformation methodologies) that is accessible to surveying practitioners.
- Examine how surveying practitioners are changing how they access the reference frame, through less emphasis on networks of ground monuments and more emphasis on Global Navigation Satellite Systems (GNSS) base stations.
- Examine the increased use of GNSS for height determination and the use of geoid models etc for connection to local height datums.
- Examine the increasing role of aerial and space based imagery in the realisation of reference frames.

### Chair

Michel Kasser (France), e-mail: michel.kasser@ign.fr and Mikael Lilje (Sweden), e-mail: mikael.lilje@lm.se as Co-Chair.

### Specific project(s)

- Contribute to convening of a round-table meeting of all organisations involved in defining or using reference frames to develop common approaches and avoid duplication.
- Continue development of Technical Fact Sheets that briefly explain basic concepts, practical applications and issues and which summarise the activities of organisations with specific responsibilities in the field.
- Ensure terminology used in above publications conform to and give substance to the relevant Standards coming from ISO TC211.
- Participate in ISO TC211 work item on Geodetic Codes and Parameters (19127), including assessment of its application in situations affecting practising surveyors.

### Workshop(s)

- Participation in FIG Working Weeks and other major Commission events (see events section below) with dedicated Technical Sessions and/or Workshops as appropriate.
- A Round-table meeting of key organisations involved in defining or using reference frames will be convened at a venue, time and date to be confirmed by the Working Group Chairs.
- Symposium on Applications of Permanent GPS/GNSS Networks. WG 5.2 and WG5.3 event.

### Publication(s)

- FIG Working Weeks will include Technical Papers on specific issues and presented by Working Group Members and other invited experts.
- Technical Fact Sheets as outlined above.
- Working group final report will be presented at FIG Congress, 2006.

### Timetable

- Draft publications will be presented at FIG Working Weeks during the term of this plan and according to a timetable to be developed by the Working Group Chairs.
- Working group final report: dedicated session, FIG Congress, 2006.

### Beneficiaries

- FIG member associations, manufacturers and users of survey equipment, governments, standardisation organisations, decision makers, GIS developers and users, surveying businesses, individual surveyors

## **Working Group 5.3 – Integrated Positioning, Navigation and Mapping Systems**

### Policy issues

Policy Issues include the following:

- Issues associated with ongoing and rapid developments in Integrated Positioning, Navigation, and Mapping systems, including performance and applications of such systems and guidelines for their use.
- Ensuring FIG input to planning associated with programs of GPS Modernisation and GNSS Development.

### Chair

- Naser ElSheimy (Canada), e-mail [elsheimy@ensu.ucalgary.ca](mailto:elsheimy@ensu.ucalgary.ca).

### Specific project(s)

- Report on the development, possibilities and limitations of new technologies.
- Prepare guidelines for practitioners on making the best use of systems to achieve the results required for particular applications.

- Develop FIG input to GPS Modernisation and GNSS Development.
- Collaborate with other Commissions and other international organisations (including IAG and ISPRS) and with equipment, software and service providers.
- Continue commitment to relevant inter-disciplinary events including the series of Symposia on Mobile Mapping (joint with IAG and ISPRS).
- Pursue “hot topics” using Ad-Hoc Sub-Groups as appropriate.

#### Workshop(s)

- Participation in FIG Working Weeks and other major Commission events (see events section below) with dedicated Technical Sessions and/or Workshops as appropriate.
- 4<sup>th</sup> International Conference on Mobile Mapping Technology, Mid-August, 2003, Kuming, China
- Symposium on Applications of Permanent GPS/GNSS Networks. WG 5.2 and WG5.3 event.

#### Publication(s)

- Guidelines on making the best use of emerging systems.
- Summary Reports on “hot topics” as they develop.
- Report on FIG’s input to GPS Modernisation and GNSS Development.
- Working group final report will be presented at FIG Congress, 2006.

#### Timetable

- Draft publications will be presented at FIG Working Weeks during the term of this plan and according to a timetable to be developed by the Working Group Chair.
- Working group final report: dedicated session, FIG congress, 2006.

#### Beneficiaries

FIG member associations, manufacturers and users of survey equipment, governments, standardisation organisations, decision makers, GIS developers and users, surveying businesses, individual surveyors.

### **6. Respect for Cultural and Linguistic Issues**

Commission 5 endorses as an underlying concept that respect for Cultural and Linguistic issues is very important and that the Commission will be sensitive to these issues in the way it works. This will be implemented by encouraging multilingual abstracts and presentations in general meetings and through the use of an appropriate regional language during regional meetings.

### **7. Co-operation with Sister Associations**

Commission 5 is committed to cooperation with Sister Associations, especially those with which FIG has a Memorandum of Understanding (MoU). Commission 5 has specific liaison interest under MoU with the International Association of Geodesy (IAG) and the International Society for Photogrammetry and Remote Sensing (ISPRS). Commission 5 also has liaison interest with the Scientific Committee on Antarctic Research (SCAR). The Commission 5

Steering Committee will ensure that Working Group activities and Commission 5 events further these goals of cooperation with Sister Associations.

## **8. Co-operation with the United Nations Agencies**

Commission 5 is committed to cooperation with United Nations Agencies. Targeting of activities, events and publications of the Commission will contribute to United Nations goals such as assistance to developing countries and sustainable development. Other activities (outlined in the next Section) will also contribute. Commission 5 will work with other Commissions on topics aimed at Developing Countries such as Low Cost Surveying Technology and appropriate Continuing Professional Development programs.

Commission 5 will also seek involvement with the UN Committee on the Peaceful Use of Outer Space (COPUOS), which has Action Items of relevance. Of particular interest is involvement in the Action Item in relation to GNSS.

## **9. Other Activities**

### **Inter-Commission Activities**

Commission 5 will be involved in Joint Commission Activities on:

**Low Cost Surveying Technology and Techniques for Developing Countries.** Joint with Commissions 3 and 7 and led by Commission 5. The activity will concentrate initially on a dedicated technical session at an appropriate Symposium or Working Week and ensure broad circulation of outcomes and papers. The topic will then be assessed to see if a full Work Plan is warranted for the longer term.

**Mobile Society and Location Based Services.** Joint with Commission 3 and led by Commission 3. The Activity will be joint between WG 3.2 and 5.3. The activity will concentrate initially on a dedicated technical session at an appropriate Symposium or Working Week and ensure broad circulation of outcomes and papers. The topic will then be assessed to see if a full Work Plan is warranted for the longer term. The Commission 3 Chair of this Joint Activity will be Martin Scheu (Germany), e-mail: [scheu@grit.de](mailto:scheu@grit.de). The Commission 5 Co-Chair for this Joint Activity will be Yang Gao (Canada), e-mail: [gao@ensu.ualgary.ca](mailto:gao@ensu.ualgary.ca).

**Vertical Reference Frame Issues in Hydrographic Surveying.** Joint with Commission 4 and led by Commission 4. The activity will concentrate initially on a dedicated technical session at an appropriate Symposium or Working Week and ensure broad circulation of outcomes and papers. The topic will then be assessed to see if a full Work Plan is warranted for the longer term.

### **Continuing Professional Development**

Commission 5 will also work with Commission 2 to contribute to **Continuing Professional Development Programs** for FIG member organisations, especially in developing countries where the resources may not be available locally.

## **Special Topic Activities**

Commission 5 will also undertake special topic activities as required. The topics will be those identified as important for the Commission or for the over-arching priorities of FIG Council and its Work Plan but that do not warrant a full Working Group. The activities may take the form of special publications, conference sessions or dedicated workshops on the topics and which one or two key people can be invited to pursue.

Commission 5 will make its contribution to the FIG World Report on Best Practices launched by the Council in its work plan for 2003–2006.

## **Liaison with Equipment, Software and Service Providers**

Commission 5 will continue to build relationships with Equipment, Software and Service Providers to ensure relevant standards and best practices are incorporated into new products.

## **Steering Committee**

As in the previous term, there will be a Steering Committee to set direction and oversee the general management of the Commission. It will be made up of all Working Group Chairs (as Commission Vice-Chairs, in line with the emerging FIG structural arrangements) and will be led by the Commission Chair.

## **Communications**

Commission 5 will develop and maintain a web page with linkages to other relevant web pages to keep commission delegates, other FIG members, users of surveying services and the public involved in and informed about the work of the Commission.

## **10. Calendar of Events**

The Events in the Calendar below have been classified according to the type of Commission 5 involvement as follows:

- **FIG WW:** The main meetings each year for Commission 5 Delegates and for the Steering Committee will occur at the FIG Working Week or Congress.
- **Strategic FIG Event:** FIG Council sees these as events for furthering its strategies. These often involve liaison with United Nations. Given that the Working Weeks are concentrated in the Mediterranean region in 2003, 2004 and 2005, Commission 5 will also concentrate effort toward FIG Events in other regions (see below) and encourage participation of Delegates in those regions. As many Steering Committee members as possible will also be encouraged to participate in those events.
- **C5 Event:** These are directly associated with Commission 5 Working Groups
- **Inter-Commission Event:** Event that furthers Inter-Commission cooperation and has Commission 5 involvement.
- **Liaison Events:** These further Commission 5 goals for Liaison and will be attended by the Commission Chair or an appropriate member of the Steering Committee.
- **UN Committees on GIS:** Commission 5 is also interested in developing better liaison with UN Committees on GIS and their Working Groups which deal with issues of relevance to Commission 5 (eg Geodesy Working Group). Many of these Committees and their Working Groups have annual meetings but have not been included below. While it

would difficult for Commission 5 officers to attend all such events, an effort will be made to establish some liaison and to attend a subset of meetings. Of particular interest are those Committees covering developing countries, including:

- African Spatial Data Infrastructure Initiative – Africa SDI, CODI
- Permanent Committee on GIS Infrastructure for Asia & the Pacific – PCGIAP
- Permanent Committee on SDI for the Americas – PC IDEA

## **2002**

- GIS'02 – International Symposium on Geographic Information Systems, 23-26 September, Istanbul, Turkey (Inter-Commission Event)

## **2003**

- FIG Working Week and XXVI General Assembly, 19–23 May, venue to be decided (FIG WW)
- Round-table Meeting on Reference Frame in Practice (see WG5.2 Work Plan above), probably attached to Working Week 2003 (C5 and Liaison Event)
- IUGG 23<sup>rd</sup> General Assembly, June – July 2003, Sapporo, Japan (Liaison Event)
- 4<sup>th</sup> International Conference on Mobile Mapping Technology, Mid-August, Kuming, China (C5 Event and Liaison Event)
- The 7<sup>th</sup> South East Asian Surveyors Congress, 3-7 November, Hong Kong, China (Liaison Event)
- Regional Meeting in for the Arab and Francophone Countries in Morocco, 1-5 December 2003 (Strategic FIG Event)

## **2004**

- FIG Working Week and XXVII General Assembly, 23-28 May, Athens, Greece (FIG WW)
- XX ISPRS Congress, 12-23 July, Istanbul, Turkey (Liaison Event)
- Regional Meeting in South-East Asia in late 2004 (Strategic FIG Event)
- Commission 5 convened event on Applications of Permanent GPS/GNSS Networks, in late 2004 in Brisbane, Australia. This will be joint with IAG. (C5 and Liaison Event)

## **2005**

- FIG Working Week and XXVIII General Assembly, 7-12 May, Cairo, Egypt (FIG WW)
- Regional Meeting in Latin America, October (Strategic FIG Event)

## **2006**

- FIG XXIII Congress and XXIX General Assembly, August - September, Munich, Germany (FIG WW)

## **Commission Officers**

### **Commission Chair**

Matt Higgins  
Senior Surveyor  
Dept of Natural Resources and Mines  
Locked Bag 40  
Coorparoo Delivery Centre  
Brisbane Qld 4151  
AUSTRALIA  
Tel + 61 7 3896 3754  
Fax + 61 7 3891 5168  
E-mail matt.higgins@nrm.qld.gov.au

### **Chair Working Group 5.1 - Standards, Quality Assurance and Calibration**

Rudolf Staiger (Germany)  
e-mail: rudolf.staiger@uni-essen.de

### **Chairs Working Group 5.2 - Reference Frame in Practice**

Michel Kasser (France)  
e-mail: michel.kasser@ign.fr) and  
Mikael Lilje (Sweden)  
e-mail: mikael.lilje@lm.se

### **Chair Working Group 5.3 – Integrated Positioning, Navigation and Mapping Systems**

Naser El-Sheimy (Canada)  
e-mail elsheimy@ensu.ucalgary.ca