

**United Nations/United States of America International Workshop on  
The Use and Application of Global Navigation Satellite Systems**

**8-12 December 2003, Vienna, Austria**

**Working Group on Training, Education and Awareness Increase**

The Working Group on Training, Education and Awareness Increases had its first meeting on 9 December 2003, under the chairmanship of prof. F. Walter (Brazil) with the participation of 15 persons from 13 countries representing four regions (see attached participants list). After hearing and thoroughly discussing all participants' proposals, suggestions and comments, vice chairperson Ms. B. Mwape (Zambia) proposed to form subgroups on a regional basis and make definite proposals. Following a thorough discussion and taking into consideration the suggestions given during the presentation to the plenary meeting, the Working group selected the following recommendations.

**SPECIFIC RECOMMENDATIONS**

Recommendation No. 1.

1. Name of responsible institute/ person: different for each workshop, local organising committee.
2. Policy framework, content of the proposal: To support, organise, celebrate workshops, conferences in different regions, such as
  - a. To celebrate a GNSS Workshop for the Latin American region in Colombia with emphasis on transportation fields. The Workshop will be held in 2004 in the frame of the IV CEA, American Space Conference Activities
  - b. To organise a GNSS workshop for Europe, dealing with the problems of GNSS applications in the new EU accession countries. The conference will be held in 2004 in Hungary under the auspices of EURISY Association.
  - c. To support the EUREF symposium (IAG Subcommittee for Europe-Slovakia) to be held in June 2004 ([www.gku.sk/euref2004](http://www.gku.sk/euref2004)).
  - d. To organise a workshop on Modern technologies, education and professional practice in geodesy and related fields. The workshop will be held in 2004 in Bulgaria, under the auspices of FIG, ISPRS, ICA. The workshop will dedicate a special session for young scientists and students.
  - e. To organise a special session on GNSS applications in the coming Latin America Remote Sensing Symposium to be held in Santiago, Chile, in November 2004.
  - f. To organise summer schools on GNSS for graduate students and young professionals. With the topics of GNSS applications in everyday life and GNSS augmentations (GBAS and SBAS)– principles and practices, in 2005 and in 2006, respectively, in

Warsaw and in Olsztyn. The duration of the summer schools is planned for 2 weeks.

- g. To organise a workshop on GNSS integration with various systems for various applications. The workshop will be held in 2007 in cooperation between Warsaw University of Technology and Czech Technical University in Prague with support of UN.

These workshops could be used as examples for other regions.

The UN OOSA should find financial background and administrative means of supporting the participation of GNSS experts in various international conferences, workshops and other meetings.

3. Actions required from OOSA
  - a. Funding support: USD 15 000 as an additional support for each workshop is recommended, to make possible the invitation of students and experts from other regions.
  - b. Feasibility study: The workshops are being organised.
  - c. Expert meeting: not necessary
  - d. Briefing: not necessary
  - e. Information material: it will be provided as outputs of the different workshops.
4. Other matters: none

#### Recommendation No. 2.

1. Name of responsible institute/ person: OOSA, in collaboration with Satellite Geodetic Observatory (dr. I. Fejes), Hungary
2. Policy framework, content of the proposal: To promote and fund the production and publication of GNSS text books, magazines in native languages.
3. Actions required from OOSA
  - a. Funding support: Production cost of a book is in the order of USD 50 000 (in case of 300 pages, 1000 copies). OOSA is requested to find financial background of this activity and manage the distribution of the support.
  - b. Feasibility study: -
  - c. Expert meeting: -
  - d. Briefing: -
  - e. Information material: OOSA is requested to compile an inventory of GNSS textbooks in different languages, specifying the short content and the level of the books. OOSA is requested to make this inventory available on the Web.
4. Other matters: none

#### Recommendation No. 3.

1. Name of responsible institute/ person:

2. Policy framework, content of the proposal: A programme of exchanging students
3. Actions required from OOSA
  - a. Funding support: USD 3000/year for each student
  - b. Feasibility study:
  - c. Expert meeting:
  - d. Briefing:
  - e. Information material: Text books
4. Other matters

Recommendation No. 4.

1. Name of responsible institute/ person: OOSA/REGIONAL TRAINING CENTERS
2. Policy framework, content of the proposal: Taking into account the UN training facilities available in Latin America, Africa, India. OOSA is asked to organize specialization courses (9 months) dedicated to GNSS applications in the timeframe of 2004-2006. They could be planned and developed by a local team together with international experienced teachers and experts.
3. Actions required from OOSA
  - a. Funding support:
  - b. Feasibility study: OOSA is requested to harmonise the curricula of the five regional centres.
  - c. Expert meeting:
  - d. Briefing:
  - e. Information material:
4. Other matters

Recommendation No. 5.

1. Name of responsible institute/ person:
2. Policy framework, content of the proposal:
  - Curricula development for local regional needs (supporting undeveloped and under transition countries)
  - Collection of information about training / teaching opportunities and subjects
  - Project and implementation of a database with teaching material at various levels:  
basic, intermediate, specialized, advanced, ....
  - Organizing editorial board for development of model teaching materials (books, web-pages, hand-outs, software, ...- suggestions for editors
  - Distance e-learning (internet), with on-site practical laboratory courses
3. Actions required from OOSA
  - a. Funding support:
    - web-master, secretary, researcher
    - meeting / workshops for experts in curricula development (2 - 3 times)
    - pilot training in selected continent / country
  - b. Feasibility study:
  - c. Expert meeting:

- d. Briefing:  
Information material:
- 4. Other matters

Recommendation No. 6.

1. Name of responsible institute/ person:
2. Policy framework, content of the proposal: To support developing and publishing of basic books in native languages, as well as a website with some introduction materials on GNSS
3. Actions required from OOSA:
  - a. Funding support: to get support from UNESCO
  - b. Feasibility study: -
  - c. Expert meeting: together with awareness programs
  - d. Briefing: -
  - e. Information material: Text books
4. Other matters

Recommendation No. 7. (GENERAL)

## **Proposal for Education, Training and Awareness Programme for GNSS Technology and Applications**

### **Summary**

1. Appointment of focal persons for each Region for coordination of GNSS education activities and submission of reports.
2. Structure should be developed at each Region and national levels with the assistance of OOSA
3. Identifying the list of Regional Training Centres/Institutions that deal for training in GNSS applications (some already have been identified). OOSA should make arrangements to train persons in different application areas
4. Guide lines should be developed both for regional and national level to suit the respective countries
5. Training programmes i.e. long term (degree level), medium term (6 months duration) and short term (1 to 2 weeks duration) would be organized by OOSA. Integration of GNSS system with the other systems should be introduced into the institutions.
6. Necessary facilities such as equipment, training material, resource person should be provided at both regional and national level with the help of donor agencies/countries.
7. Exchange of programmes should be encouraged
8. Special application course should be introduced

### **Introduction**

- The Global navigation Satellite Systems is being used in a variety of discipline areas around the world for accurate position determination on ground and many countries around the world are using this GNSS Technology.
- The developing countries are trying to adopt this technology in various disciplines, however the situation analysis which had been conducted from various sources reveal that the level of knowledge and skills in the use and application of GNSS is extremely low in some Regions/Country and as such the benefits and its applications can never be realized.

### **Starting point**

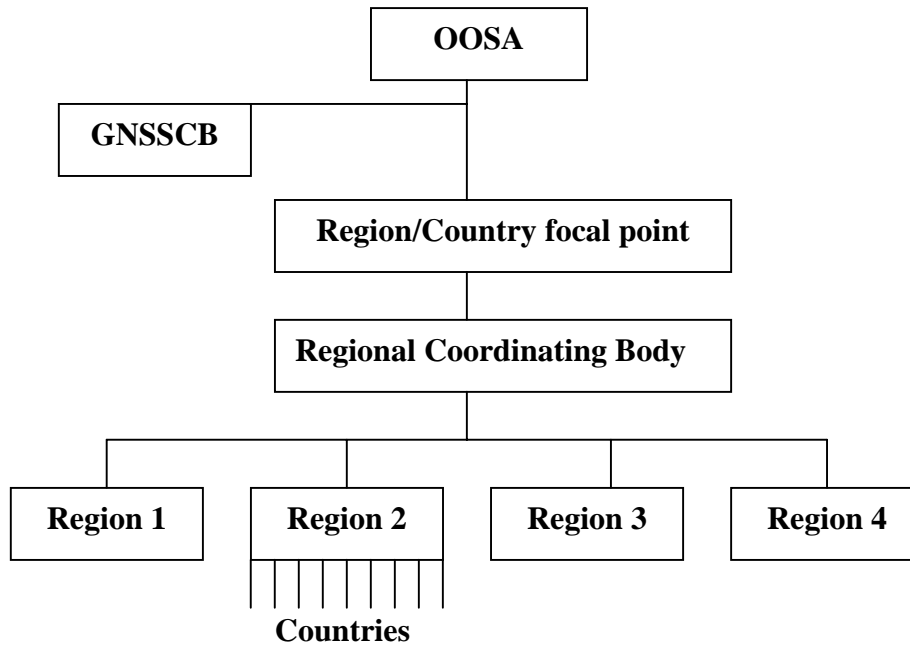
#### ***Awareness programmes***

Starting point for these Regions/Country is the need to develop structure and systems on how information would be disseminated through awareness programmes.

#### ***Training and education***

Training is one of the crucial components that is needed. Sometimes there are infrastructure available such as buildings, training facilities, but there are lacking in experts, equipment, training materials etc.

## **STRUCTURE**



## **Roles and Responsibilities**

### ***OOSA***

OOSA among many other duties will play as mother body and will capture all activities that will take place.

It will appoint the focal persons for Region/Country and regional coordinators.

OOSA will also assist in finding experts for training, scientific visits, feasibility studies, seminars, workshops etc., and will play an advisory role.

### ***GNSSCB***

GNSSCB would provide the coordination among the GNSS operators and user countries.

### **Region Focal Persons**

Regional/Countries focal person will coordinate regional activities and provide the report to UN OOSA annually.

### **Regional Bodies**

Regional bodies will support the establishment of national coordinators who will be appointed by their respective governments.

They will oversee the training of personnel, curriculum development in their regions, development of database of resource persons, institutions, user organizations etc.

The regional bodies will meet twice a year to plan for their activities for their respective regional countries and evaluate and monitor programmes.

### **National Co-ordinators**

The National Focal Persons will be appointed by their respective governments and will coordinate national activities in the areas of GNSS.

### **Challenges**

- Diversity of cultural background
- Different priority areas
- Inadequate infrastructure and facilities
- Lack of awareness at policy/decision-maker level
- Lack of awareness and knowledge at user level
- Less general public awareness and education institutions
- Non-availability of necessary equipment
- Non-availability of Resource Persons and trained manpower
- Non-availability of training material

### **Target Groups / General Policy**

Decision/policy-makers such as government officials from ministries, politicians, heads of financial institutions, educationists, etc. These are the persons that will have bearing on the introduction and application of the GNSS as they are the people that handle resources.

Users organizations such as Agriculture, Hydrology and Water Resources, Survey and Mapping, Health, Disaster Monitoring and Management, Environment Protection Agencies, Aviation and Navigation, Transportation etc.

General public.

Institutions like universities, schools etc., (the integration of the curriculum into the existing courses).

### **Standardization**

- Since in some Regions/Countries there is little knowledge about GNSS technology and its applications the need arises to standardize the procedures – basic concepts.
- Provide training and education to each level of intervention.
- There is a need to standardize the course curriculum, procedures to use field equipment in various disciplines, computer hardware and software to process data and generate output results and products.
- The other purpose of the training structure proposed above is to exchange the information between the Regions/Countries so that these Regions/Countries can directly use the information provided by other Regions/Countries.
- At the national level, each country can have standard procedures, symbol, technical terms, projection systems, level of information on different scales of maps etc.

### **Infrastructure**

Almost all Regions/Countries have the facilities to train the persons. However, there is a non-availability of field equipment, and computer hardware and software to process the field data and most importantly the trained manpower and resource persons, training material and information in the field of GNSS.

If such equipment is sourced at the regional level and then later at the national level it would be of great importance.

### **Human Resource Development**

The need for capacity building is very crucial in the field of GNSS applications.

- **Long Term Training Courses (Masters and higher level degrees)**
- **Medium Term Training Courses (Six months duration).**
- **Short Term Training Courses/Workshops (One to two weeks duration.**
- **Integration of Curriculum into the Institutions like Universities, colleges and schools**
- **OOSA will provide the list of institutions offering the training in GNSS.**

Personnel from the Regions should be sent to the selected institutions (decided by OOSA) with the view to set up regional capacity for sustainability of human resources. Four persons from each region will be identified and names forwarded to institutions. Scholarships would be welcome from the donor agencies and governments.

### **Student Exchange Programmes**

Students from different parts of the world will also have a chance to have exchange programmes at both the regional and national level. This will enhance sharing of knowledge and ideas based on need. The programme will be very fruitful for all Regions.

### **Funding**

The funding is required for establishing the proposed structure, equipment and training facilities at the national and regional levels, visits of resource persons to carry out short and medium term courses, as well as, to organize short, medium term courses. The funding and scholarships are also required to send the persons for higher degree education in the field of GNSS. It will also be required to carry out an awareness campaign in print, as well as electronic media, for the awareness of people, especially for the general public. Following are the details of the funding required.

### **Funding Requirements (for each Region)**

(Estimate)

<b>1.</b>	<b>Establishment of the structure</b>	<b>USD 500 000</b>
<b>2.</b>	<b>Long Term (4) persons from each Region and (# depends of the Region) persons from countries</b>	<b>USD 500 000</b>
<b>3.</b>	<b>Medium Term Training</b>	<b>USD 200 000</b>
<b>4.</b>	<b>Short Term Training</b>	<b>USD 100 000</b>
<b>5.</b>	<b>Awareness Programme (30)</b>	<b>USD 600 000</b>
<b>6.</b>	<b>Training equipment, facilities and material</b>	<b>USD 1000 000</b>

### **Implementation Plan (suggestion)**

- |   |                      |
|---|----------------------|
| <b>1. Approval of project from OOSA</b>   | <b>February 2004</b> |
| <b>2. Appointment of Regional focal persons</b>   | <b>March 2004</b>    |
| <b>3. Appointment of Regional Bodies</b>  | <b>April 2004</b>    |
| <b>4. Nomination of national focal point by respective Govt.</b>                          | <b>May 2004</b>      |
| <b>5. Planning Meeting by Regional Team</b>   | <b>June 2004</b>     |
| <b>6. Identification of Institution for Long, Medium, and Short Term Training Courses</b> | <b>July 2004</b>     |
| <b>7. Awareness programme and Training commence in various countries</b>                  | <b>August 2004</b>   |



## List of Participants

### Working Group on Training, Education and Awareness Increase

(Vienna, 8-12 December 2003)

Name	Position / Unit and Organization	Country / International Organization
Fernando <b>WALTER</b> [Chair]	Head of GNSS Laboratory Departamento de Telecomunicações Divisão de Engenharia Eletrónica Instituto Tecnológico de Aeronáutica (ITA)	Brazil
Előd <b>BOTH</b> [Vice Chair]	Director Hungarian Space Office	Hungary
Beatrice <b>MWAPE</b> [Vice Chair]	Medical Imaging Specialist	Zambia
Sándor <b>FREY</b>	Astronomer, PhD FÖMI Satellite Geodetic Observatory Institute of Geodesy, Cartography & Remote Sensing	Hungary
Cynthia <b>JUNQUEIRA DE QUEIROZ</b>	Aerospace Technical Center Aeronautical & Space Institute (CTA-IAE)	Brazil
Janusz <b>NARKIEWICZ</b>	Head of Department Faculty of Power & Aeronautical Engineering Warsaw University of Technology	Poland
Paulo Roberto <b>MARTINI</b>	Head, User Service Remote Sensing Division Brazilian Institute on Space Research – INPE	Brazil
Kota <b>TANABE</b>	Special Adviser Permanent Mission of Japan to the United Nations (Vienna)	Japan
Frantisek <b>VEJRAŽKA</b>	Czech Technical University	Czech Republic
Octavian <b>BALOTÁ</b>	INTEGRIS Bucharest	Romania
Katarina <b>LEITMANNOVA</b>	Institute for Geodesy & Cartography	Slovak Republic
Rebecca <b>CASSWELL</b>	US Coast Guard Navigation Center	USA
Isabel Pereira <b>OSÓRIO</b>	Department of Mathematics Applications, University of Porto	Portugal
Alexandra <b>CORTES-ARÉVALO</b>	Unidad Administrativa Especial Aeronautica Civil	Colombia
Shafiq <b>AHMED</b>	Pakistan Space & Upper Atmosphere Research Commission (SUPARCO)	Pakistan