

# **53<sup>th</sup> Meeting of the EUREF Technical Working Group in Gävle, 01. June 2010**

**Meeting place:** Lantmäteriet, Lantmäterigatan 2, Gävle.

**Time schedule:** Tuesday, 01. June 2010, 9.00 - 18.30

## **Next events:**

- EUREF 2010 TWG Fall Meeting: Lisbon, Monday, November 22 - Tuesday, November 23 (noon to noon)
- EUREF 2011 TWG Spring Meeting: date and place not yet fixed
- EUREF 2011 Symposium Meeting: Chisinau/Moldova, Tuesday, May 24, 2011 (full day)
- EUREF 2010 Symposium Meeting: Chisinau/Moldova, Wednesday, May 25 - Saturday, May 28, 2011

## **Agenda**

1. Opening
2. Minutes of the 52<sup>th</sup> TWG meeting in Vienna
3. EUREF-Czech-2009 densification campaign
4. EUREF IE/UK 2009
5. ETRS89 realization of the HEPOS network
6. Guidelines for EUREF densifications
7. EUREF Permanent Network
  - a) Report of EPN Analysis
  - b) EPN Real-time analysis/ETRF2000 orbits
  - c) EPN reprocessing project
  - d) Galileo and related issues
8. EUREF/ETRS89 web
  - a) Monitoring of official national ETRF coordinates on EPN web
  - b) EUREF campaigns web pages
  - c) EUREF home page
9. EUPOS combination centre
10. ITRF2008 and transformation to ETRF2000
11. Report on ETRS89 Working Group
12. What does EUREF consider as a realization of EVRS?
13. INSPIRE progress report
14. ECGN
15. Collaboration EPOS/EUREF/WEGENER
16. EUREF Symposium 2010
  - a) Organization
  - b) Best student poster award
17. EUREF 2011 Symposium
18. Divers
  - a) Commission 1 symposium - REFAG
  - b) AFREF
19. Next TWG Meeting
20. Action Items

## Participants

ZUHEIR ALTAMIMI, Paris  
GEOFF BELL, Belfast (guest) (08.03.)  
ELMAR BROCKMANN, Berne  
CARINE BRUYNINX, Brussels (Chair)  
ALESSANDRO CAPORALI, Padova  
JAN DOUSA, Prague  
RUI FERNANDES, Covilhã  
MICHAEL GIANNIOU, Athens (guest)  
HEINZ HABRICH, Frankfurt a.M.  
HELMUT HORNIK, Munich (Sub-comm. Secretary)  
JOHANNES IHDE, Frankfurt a.M. (Sub-comm. Chair)  
AMBRUS KENYERES, Budapest  
MARTIN LIDBERG, Gävle

JAAKKO MÄKINEN, Helsinki)  
MIKAEL LILJE, Gävle (guest)  
MARIA OVDII, Chisinau (guest)  
MARKKU POUTANEN, Helsinki  
HERMANN SEEGER, Bad Neuenahr-Ahrweiler (hon. member)  
WOLFGANG SÖHNE, Frankfurt a.M.  
GÜNTER STANGL, Graz  
JOAO AGRIA TORRES, Lisbon  
MANUELA VASCONCELOS, Lisbon (guest)  
CHRISTOF VÖLKSEN, Munich (guest)  
GEORG WEBER, Frankfurt a.M. (guest)

## Minutes

### 1. Opening

In her property as chairwoman of the EUREF Technical Working Group (TWG), C. BRUYNINX opens the 53th meeting of the EUREF TWG and welcomes the participants. On behalf of the TWG she thanks the Swedish Lantmäteriet, especially M. LIDBERG, for hosting this meeting.

A draft of the agenda has been distributed among the TWG, the participants accept the agenda.

### 2. Minutes of the 52th TWG meeting in Vienna

The minutes of the 51th TWG Meeting in Vienna, 08.-09.04.2010, were distributed among the TWG members. Some few corrections are to be attached. The final text is to be published in the EUREF homepage.

### 3. EUREF-Czech-2009 densification campaign

J. DOUSA has distributed a file. He summarizes the facts on the previous campaigns since 1991 stating that only rather few commons sites exist. The initial basic network originates in 1927. In all the coordinates of 46500 sites have to be re-determined according to the new reference network.

The new EUREF-Czech-2009 campaign comprises 44 permanent GPS stations on the territory of the Czech Republic and further 17 EPN stations in other European countries selected upon special criteria. The whole campaign covers four years of data recording although many sites were observed for one year only. The station Snezka had to be excluded as fiducial point with respect to the large variations due to severe problems caused by frequently occurring heavy snow fall.

The daily processing basing on the EPN cumulative solution EPN\_A\_ITRF2005\_C1570 fits rather good

with the EPN data. For the final combination four variants were tested in order to receive the best possible result. The data analysis resulted in the rejection of 0,5% of the total of data. The repeatability of the coordinates amounts 2 mm in the horizontal and 4 mm in the vertical. The compatibility with older ETRS89 solutions is on the cm-level.

The TWG discusses the details. Concerning the lack of coordinates velocities J. DOUSA remarks that this campaign aims especially on a best available set of coordinates. Finally the TWG basically accepts the solution as class B (cf. also Resolution 1 of the EUREF 2010 Symposium in Gävle). However, for the final report the velocities are to be estimated strictly following the guidelines. In this context it is concluded that C. BRUYNINX should check and if necessary re-formulate the part on velocity estimation in the guidelines for EUREF densifications in order to express more clearly which input is required for velocity estimation.

### 4. EUREF IE/UK 2009

The EUREF IE/UK 2009 report had already been presented to the last TWG Meeting in Vienna, 08.-09.03.2010. The solution had been accepted, however, it was recommended to re-write the text according to the recommendations of the TWG and to present it once more. The new text was distributed by circular letter. By proxy of M. GREAVES, G. BELL presents the updated version. The TWG states that all requirements are fulfilled now and accepts the solution as class B (cf. also Resolution 1 of the EUREF 2010 Symposium in Gävle). A final report for publication will be prepared.

### 5. ETRS89 realization of the HEPOS network

This report has been presented to the TWG Meeting in Vienna as well. The TWG thus recommended to re-

process the data from the HEPOS campaign following strictly the EUREF guidelines and apply the memo to convert to ETRS89. The comparison of the ETRS89 coordinates of this campaign and the current ETRS89 coordinates used in Greece should allow to assess the level of agreement of the current HEPOS realization with the ETRS89. M. GIANNIOU has prepared an updated report according to all requirements. The file was submitted to the TWG in time and is presented orally to the TWG plenary.

The solution comprises in all 98 permanent GPS sites distributed over the territory of Greece. Numerous sites are located on islands to allow an accurate connection to the mainland. The repeatability turns out to be sufficient on the sub cm level. The differences between the recent HEPOS solution and ETRS89 coincide within a few cm.

Concerning the practically used coordinates within Greece it is stated that it is up to the local authorities which coordinate set is used. However the used data have to be consistently linked to the ETRS system allowing to compute precise values in both systems. It is discussed whether it is useful to validate a coordinate set which will not be practically used. Thus the situation has to be documented clearly describing the used coordinate set and the consistent relation to other ones. M. GIANNIOU also mentions that in Greece partly considerably large terrain movements occur, therefore a re-observation of the whole network is planned to be carried out within some years. Then the analysis hopefully will allow a better insight into the geo-tectonic situation.

The TWG accepts the solution EUREF GR 2007 as class B (cf. also Resolution 1 of the EUREF 2010 Symposium in Gävle). In the final report it will be mentioned that the recent solution is fulfilling the requirements of EUREF and an internal coordinate set is used. This set is clearly connected to the recent solution on an adequate level of consistency.

## **6. Guidelines for EUREF densifications**

C. BRUYNINX has distributed the draft guidelines, various comments have been forwarded. It is emphasized that the guidelines are to be formulated as clear and consistent as possible to allow an easy application by the users to avoid any misunderstandings. C. BRUYNINX will complete the texts and put the final version into the web.

## **7. EUREF Permanent Network**

C. BRUYNINX will present the usual EPN CB report to the plenary of the following 2010 EUREF Symposium.

### **a) Report of EPN Analysis**

H. HABRICH gives a summarizing overview in the activities. The detailed report will be presented to the following Symposium.

The LAC Military University of Technology, Poland (MUT) has transferred his tasks to the Warsaw University of Technology (WUT), however, the MUT will act further on as a new installed LAC. This increase of LACs should comprise the possibility to upgrade the redundancy from 3 to 4 LACs for all sites.

With date 12.02.2010 the Guidelines for EPN Analysis Centres have been completely revised.

Finally H. HABRICH gives an overview on the draft programme of the next LAC Workshop which will take place in Warsaw from 18.-19.11.2010.

### **b) EPN Real-time analysis/ETRF2000 orbits**

W. SÖHNE summarizes his report which will be presented in full detail to the following Symposium. The topic refers to an action item of the last TWG Meeting in Vienna to provide details on the generation of ETRF2000 orbits and results on the usage including descriptive examples of usage of these orbits for computing positions in the ETRS89. The concerning web-pages can be seen in [http://www.epncb.oma.be/\\_trackingnetwork/siteinfo4onestation](http://www.epncb.oma.be/_trackingnetwork/siteinfo4onestation).

In the discussion G. WEBER emphasizes the aim to develop the software such that the user only needs to declare the system (EUREF/SIRGAS/etc.) used, but all further transformations are carried out automatically. All these issues are to be presented to the public and the users be convinced to use these possibilities. The role of EUREF is to provide coordinates which serve as a basis as well to store data streams, orbit and clock information. This would enable EUREF to develop to a GNSS provider. G. WEBER adds that these products are freely available.

It is recommended to present these details to the Symposium plenary and the colleagues be invited to test the procedure.

### **c) EPN reprocessing project**

The Working Group "EPN reprocessing project" comprises presently ca. 30 members among which all LACs are represented. Due to the numerous participating groups different software packages are used, too. Thus interesting insights can be expected. ROB has installed a data centre to collect all historical data.

For the present status CH. VÖLKSEN mentions that the Pilot Processing is in progress for 50%. The selection of strategies (analysis strategy, standards to be used, orbits to be used, network configuration, additional sites) is

still open. The realization of a special web-based WIKI is planned, by this tool information can easily be shared, a forum for discussions be opened and everybody enabled to contribute. The access can be – depending on the needs - open for anybody or be restricted individually.

The first results of the recomputation look very promising. The yielded coordinates are still varying, but more and more around the zero-value with relatively small rms values.

As outlook for the near future CH. VÖLKSEN states that the pilot processing will be finished within a few weeks, the analysis of the results will follow. He further informs that the IGS intends to carry out a “repro2 campaign”. The available software packages are to be developed further on to meet future requirements e.g. the re-processing of GLONASS data as well.

#### **d) Galileo and related issues**

W. SÖHNE reports on the present development of GALILEO as well as a recent meeting in the BKG with colleagues from CODE to discuss questions coming up relating GALILEO. It is proposed to install a special Working Group within the EUREF TWG to deal these questions.

In the discussion C. BRUYNINX mentions that the IGS also adapts its infrastructure due to the future demands. It is hoped that in future one common RTCM (Radio Technical Commission for Maritime Services) format will be used, thus only one raw data format will exist and the data handling be simplified. G. WEBER means that the European countries spend enormous sums of money for the development and GALILEO will be completed anyway. Thus EUREF should not miss the opportunity but join these activities in time. J. IHDE adds that EUREF has not the task to promote GALILEO, this task has to be done by those who are officially responsible. However, EUREF should be engaged in the practical application of the system similar to its actual activities in GPS and also GLONASS.

Finally the TWG decides to prepare a proposal for creating a WG (or EPN Pilot Project) on GNSS modernization/Galileo/RINEX 3. As members E. BROCKMANN, C. BRUYNINX, A. CAPORALI, R. DACH, J. DOUSA, H. HABRICH, W. SÖHNE and C. VÖLKSEN are nominated. The topic will be put on the agenda for the next TWG again (cf. also Resolution 3 of the EUREF 2010 Symposium in Gävle).

## **8. EUREF/ETRS89 web**

### **a) Monitoring of official national ETRF coordinates on EPN web**

At present the EPN comprises 243 active sites distributed over the territory of 40 countries. In this project the official ETRF coordinates of 149 sites located in 22 countries have been used for the actual investigation. As E. BROCKMANN reports the comparisons of the ETRS89 coordinates with the EPN reference solution shows that in middle Europe the coordinates are coinciding rather good in the horizontal as well as in the vertical. On the edges, however, differences in the range of a few cm in all dimensions occur. As expected, the graph shows the large translation of station AQU1 due to the severe Abruzzo earthquake on 06.04.2009. This case represents clearly the visible influence of terrain movements, it can be stated that the permanent monitoring of coordinates can help to come to a deeper insight of the behaviour of the Earth in general, including influences such as post glacial rebound or geo-tectonic movements especially in the south east of Europe.

In the discussion the question of the identifier of officially used national reference systems is discussed. On the one hand a strictly defined declaration would be desirable, on the other hand it should be let to the countries to choose their most adequate own definitions. In any case a clear and definite description is necessary. Moreover, the definitions will become unified for practical purposes anyway. J. IHDE proposes to send out another letter to all NMAs asking for the status the present application of the ETRS89 and especially for the label and status of CRS in the respective countries. J. TORRES recommends to merge these activities together with INSPIRE as this action is carried out anyway on an official level and thus will be accepted better.

Finally the TWG asks C. BRUYNINX and J. TORRES to send out a questionnaire letter to all NMAs asking for the status of ETRS89 and for the name and status of the respective CRS.

### **b) EUREF campaigns web pages**

G. STANGL presents an example ([ftp://olggps.oeaw.ac.at/pub/EUREF\\_camp/EUREF\\_campaigns\\_test.html](ftp://olggps.oeaw.ac.at/pub/EUREF_camp/EUREF_campaigns_test.html)) for the description of sites within EUREF campaigns. The available information in older campaigns is mostly rather inhomogeneous, generally a written report together with information on the used stations names, coordinates and accuracies is given. Due to more strict guidelines since 1997 the related countries are urged to deliver additionally site descriptions (station logs), SINEX files of coordinates (free network and minimally constrained), coordinates together with velocities related to the ITRF as well as ETRF, information on fiducial sites with coordinates and velocities used.

According to the present situation G. STANGL states that there is only few request by EUREF for public use of sites anymore. Moreover due to the enormous development of computer and storage facilities as well as software the initial limitation of the number of sites by EUREF may be considered as obsolete. More and more campaigns now comprise also private sites for which no detailed information is available. Further on, it cannot be expected that the data centres are informed on updates of the sites concerning the equipment or even station names. Thus the gathered information can only be related to a specific campaign but not to the station in general. Therefore G. STANGL rises the question to reflect whether some deliverables in the guidelines such as site description might be dropped.

On the other hand it is emphasized that in spite of the enormous work the continuous documentation of these data would be useful in order to avoid the definite loss of all this information. Moreover this documentation serves as a good tool to show all the EUREF activities to the public. In order to continue the activity H. HORNİK is asked to provide all relevant available digital reports with coordinates to G. STANGL to complete the webpage. G. STANGL then will cooperate with M. VASCONCELOS to integrate the webpage into the EUREF homepage.

### c) EUREF home page

M. VASCONCELOS has distributed a draft version for the new EUREF Homepage, numerous comments have been provided. An updated concept then has been developed and is presented. The TWG discusses the various items. Some sub-sites such as “other documents” are rather old and should be better closed if there is no new input.

The relevant sub-sites are to be updated till mid 2010 as follows: EVRS & CRS – J. IHDE, ETRS89 – Z. ALTAMIMI, ECGN – M. POUTANEN, EUREF-IP – W. SÖHNE, EPN – CB, ICG – J. IHDE, mailing list – H. HORNİK; products, IGS – C. BRUYNINX, EUPOS (collaborations) – A. KENYERES, FIG Comm. 5 (collaborations) – M. LILJE, WEGENER (collaborations) – A. CAPORALI, IAG WG regional dense velocity fields (collaborations) – C. BRUYNINX. M. VASCONCELOS is asked to adapt the layout according to the proposals of the TWG.

## 9. EUPOS combination centre

On behalf of the EUPOS Combination Centre (ECC), A. KENYERES reports on a recent meeting on Novi Sad, Serbia. A relating report on EUREF was presented on this occasion. As motivation for EUPOS can be listed

- homogenization of the national EUPOS/GNSS networks and solutions;

- better referencing to ETRS89;
- long term site monitoring;
- prepare EUPOS for scientific studies;
- time series analysis (filtering, offsets, seasonal effects ...);
- velocity modeling.

Originally EUPOS covered especially the East European states, meanwhile it is extending over the Eastern border lines to Kazakhstan etc. On the other side the enormous number of sites to be maintained causes problems which can only be solved with an extended input of personnel and computer facilities. The procedures and guidelines are principally rather similar to those used in EUREF, however, the organisation and cooperation does not reach the quality level of EUREF. At present only five Analysis Centres are really working.

A. KENYERES proposes to promote a projet for EUPOS to install a combination centre similar as in the EPN to combine the national EUPOS solutions with weekly EUREF solutions.

J. IHDE comments that in some countries EUPOS takes care for RTK networks for positioning, however, there is a lack of reliable and continuous structure behind. Moreover private agencies are included, too. These agencies primarily are aiming on financial profit but often do not provide the data for public use. It is mentioned that countries located outside the area of EUREF and thus join EUPOS. G. WEBER mentions that within the UN and in the public in general EUREF and EUPOS are hardly distinguished. There is no possibility to prevent other organizations to treat similar topic as EUREF is doing and to use the free accessible data. Thus EUREF should make efforts to present its activities to the public more intensively.

Considering the membership of A. KENYERES in the EUREF TWG and the EUPOS Combination Centre (ECC) as well, he is asked by the TWG to take care of contacts to EUPOS in order to use common data sets (in particular the EPN) and same guidelines. A relevant report will be presented at the next TWG meeting.

## 10. ITRF2008 and transformation to ETRF2000

Z. ALTAMIMI summarizes his report which will be presented in full detail to the following Symposium. The origin of the ITRF2008 is defined by SLR, the scale by a mean value derived from SLR and VLBI. The orientation is aligned to ITRF2005. In all 131 sites including 179 stations (some “sites” comprise more than one “station”) have been used, 104 of them are located on the northern hemisphere and only 27 on the southern hemisphere. Although a large number of input data to define the ITRF is available, Z. ALTAMIMI criticises this

unbalanced distribution of sites relating both hemispheres. Moreover, the number of discontinuities is considerably high.

The comparison of the new ITRF 2008 with the previous 2005 version shows relatively small differences and minor rms values as well, i.e. the solutions can be considered as increasingly consistent.

The EPN contributes to the ITRF2008 with 130 sites including 150 stations. In all the EPN presents a highly accurate densification of the ITRF within Europe. Z. ALTAMIMI explains in detail the definition and realization of the ETRS89. Following the TWG recommendation the ETRF2000 is adopted as the conventional frame of the ETRS89 system. The 14 transformation parameters are provided from ITRF2005 (and new ITRFyy) to ETRF2000 with the goal to harmonize the ETRS89 realization over all Europe and thus to avoid coordinates jumps due to reference frame change.

As Z. ALTAMIMI recommends, the “Boucher-Altamimi-memo” should be updated by the 14 parameters from ITRF2008 to ETRF2000. An evaluation campaign by the TWG to test the transformation parameters should be carried out and finally the updated memo be adopted and published.

#### **11. Report on ETRS89 Working Group**

M. LIDBERG gives an overview on the recent activities of the group. A telephone conference has been held on April 9. Considering the fact that this work will take a longer time, it is proposed to summarize from time to time the actual status and forward the new findings to the community. Moreover the work should be linked to the activities of E. BROCKMANN (cf. topic 8). J. TORRES is asked to continue the connections to INSPIRE concerning the use of the ETRS89. J. IHDE will send a letter to EuroGeographics (D. LOVELL) to inform on the activities.

#### **12. What does EUREF consider as a realization of EVRS?**

M. LIDBERG reports on the work. J. IHDE adds that recently the new UELN data have been distributed to the participating countries and the feedback is rather positive. As several countries use their own systems and carry out own adjustments, the relevant transformation parameters should be listed and published in the web. Moreover, the procedure for processing the global data (GNSS, geoid) are not identical to those used in Europe.

The TWG decides to put the item on the agenda for the next TWG Meeting to be discussed then in more detail.

#### **13. INSPIRE progress report**

This topic was partly included in topic 11, a more detailed discussion is postponed due to the lack of time.

#### **14. ECGN**

Introducing M. POUTANEN lists the objectives of the European Combined Geodetic Network (ECGN) as an integrated European Reference System for Spatial Reference and Gravity

- realization of a terrestrial reference system and maintenance of long time stability with an accuracy 10-9 for Europe especially in the vertical component;
- in-situ combination of space geodesy (GPS) with Earth gravity parameters (gravity, heights);
- modelling of influences of time depended parameters to TRF (of the solid Earth of the Earth gravity field, the atmosphere, the oceans, the hydrosphere);
- modelling of terrestrial gravity field components to validate satellite gravity missions;
- geodetic platform in Europe for geo-initiatives (GMES, INSPIRE, GEOSS, GGOS).

Concerning the last item it is stated that the ECGN cannot fulfil all tasks as a European contribution to the IAG's Global Geodetic Observation System (GGOS). At the business meeting of the IGGC at the Gravity and Geoid 2002 Symposium in Thessaloniki the ECGN project as a cross-commission project was approved. Therefore the primary concern of the project consists in connecting the height component with the gravity determination while allowing for measuring data that are acquired in the European coastal regions and above adjacent seas.

The input for the meta-databases and data archives comprises data from VLBI, SLR, GNSS, DORIS, levelling, tide gauges as well as absolute, superconducting and spring gravimeters. The data are provided and stored by various organizations (IAG Services, EUREF, etc. ) and are only partly available.

M. POUTANEN remembers that at the last TWG Meeting the chances to realize the ECGN were considered more pessimistic, however, the situation now has improved due to new ideas and the project should proceed. It is emphasized to concentrate on the realistic possibilities instead of continuing plans which obviously cannot be verified. ECGN cannot deliver all possible items but the goal have to be adapted to the limited resources of personnel, funding and time.

Basing on these conclusions the TWG members are asked to express their opinion on the continuation of the ECGN within the next few weeks. M. POUTANEN then will prepare a new white paper on ECGN to be presented to the EUREF community.

## 15. Collaboration EPOS/EUREF/WEGENER

A. CAPORALI reports on a recent working meeting on occasion of the 2010 EGU Vienna. EPOS (European Plate Observing System – <http://www.epos-eu.org/>) is aligned to activities of WEGENER with the PLEGG (Platform for European GNSS and other Geo-products) proposal and CEGRN. The main objectives are to organize and promote research infrastructure as well as e-science for data and observatories on earthquakes, volcanoes, surface dynamics and tectonics. EPOS is an initiative in response to the EU policy.

As specific missions for EPOS there are mentioned

- create a single sustainable, permanent observational infrastructure, integrating geophysical monitoring networks, local observatories and experimental laboratories in Europe and adjacent regions;
- provide open access to distributed geophysical and geological data and modelling tools, enabling a step change in multi-disciplinary scientific research into natural hazards, environmental change, and energy resources;
- build a strongly competitive European research infrastructure providing a radically new landscape and widening horizons for solid Earth science research in Europe through a comprehensive e-infrastructure;
- foster trans-national coordination of solid Earth observing systems at the European level;
- promote cross-disciplinary approaches to challenging scientific and technological issues in Earth sciences through links with marine and space observations.

Currently geodesy is currently not represented in EPOS but would be generally welcome in particular to organize a research infrastructure concerning a GPS part in the initiative. EUREF can play an important role in EPOS by making available highly precise position and velocity data.

M. POUTANEN mentions the plans for an extra Symposium at the 2011 EGU in Vienna which would be an adequate possibility to present the ideas for a contribution and co-operation of EUREF. A. CAPORALI emphasizes not to wait too long but start soon to get practically involved in the initiative.

The TWG asks A. CAPORALI to circulate therefore relevant information among the TWG asap.

## 16. EUREF Symposium 2010

### a) Organization

L. ENGBERG presents the organisational work of the LOC for the ensuing 2010 EUREF Symposium. The

time schedule is discussed, the members for the Resolution Committee are nominated.

### b) Best student poster award

On behalf of the group for the best student poster award (CALVERT, IHDE, TORRES), J. TORRES reports that two posters have been submitted. The award will be dedicated to O. BJELOTOMIĆ for the poster *Local applicability of orthometric heights obtained from a geoid model*.

## 17. EUREF 2011 Symposium

J. IHDE reports that the invitation of the NMA Moldova to EUREF has been discussed in the TWG. The TWG thankfully accepts the invitations to hold the 2011 Symposium in Chisinau. As date May 17-21, 2011 is proposed. In her property as head of the Department of Geodesy, Mapping & GIS, M. OVDII explains the structure of geodetic work in Moldova and presents her pre-arrangements for the symposium.

## 18. Divers

### a) Commission 1 symposium - REFAG

Z. ALTAMIMI invites for the IAG Commission 1 symposium – Reference Frames for Applications in Geosciences (REFAG2010) which will be take place from October 4-8, 2010 in Marne la Vallée, France. Detailed information is to be found e.g. in the website of IAG Commission 1. Altogether six sessions will be held, contributions of EUREF will be presented in Session 3 – Definition, establishment, maintenance and integration of regional reference Frames (conveners J. TORRES/M. CRAYMER).

### b) AFREF

The topic is postponed to the next TWG meeting.

## 19. Next TWG Meeting

R. FERNANDES invites the TWG to hold the 2010 Fall Meeting in Portugal. Place and date are to be fixed asap.

## 20. Action Items

C. BRUYNINX and H. HORNIK will complete the Action Items and distribute the text asap.