

**WORLD METEOROLOGICAL ORGANIZATION**

**COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION**

**CIMO MANAGEMENT GROUP  
Second Session**

**Bucharest, Romania**

**2-3 May 2005**

**FINAL REPORT**



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## EXECUTIVE SUMMARY

The second session of the CIMO Management Group (CIMO-MG) was held in Bucharest, Romania, 2-3 May 2005. The CIMO-MG evaluated the progress achieved in the work programmes of the expert teams. It expressed its satisfaction with the work done so far, overcoming the expectations, especially when the Fourteenth WMO Congress was not able to allocate any financial resources to WMO instrument intercomparisons.

The CIMO-MG reviewed the working structure of CIMO as stated in Resolutions 1, 2 and 3 (CIMO-XIII) and agreed on adjustments needed to ensure the continuing effective management of CIMO expert teams and to tackle specific issues related to the Natural Disaster Prevention and Mitigation (NDPM) Programme, the Global Earth Observing System of Systems (GEOSS) and the Quality Management (QM) Framework.

The CIMO-MG therefore decided: (a) to include in the composition of the CIMO-MG, a coordinator on GEOSS and a coordinator on NDPM; (b) to designate new co-chairperson of OPAG-SURFACE and; (c) to establish a Rapporteur on QM. In this regard, the acting president approved new resolutions on behalf of the Commission. The CIMO Members will be informed of these changes by a separate letter.

The CIMO-MG reviewed the CIMO Activity Plan and discussed in detail the status of the WMO Intercomparisons, Flexible Upper-Air Systems, CIMO Guide and IOM Reports. It also considered the development of GEO/GEOSS and WMO NDPM Programme and WMO QMF and agreed upon the way to interact with these programmes.

The CIMO-MG discussed the organizational aspects of the next CIMO Session, TECO and METEOREX. In the absence of an official invitation from WMO Members, the Technical Conference (TECO-2006) and the Fourteenth CIMO Session are therefore tentatively scheduled to be held respectively from 5 to 7, and from 8 to 14 December 2006, at the WMO HQ in Geneva. The METEOREX would not be organized on this occasion due to the proximity of another exhibition (METEOHYDEX) organized alongside the Fifteenth WMO Congress in May 2007.

## GENERAL SUMMARY

### 1. ORGANIZATION OF THE SESSION

#### 1.1 Opening of the session

1.1.1 The second session of the CIMO Management Group (CIMO-MG) was opened on Monday, 2 May 2005 at 08:30 hours by Dr R. P. Canterford, the Acting president of CIMO. He welcomed the participants and wished them pleasant stay in Bucharest. The list of participants is given in [Annex I](#).

1.1.2 Mr D.C. Schiessl, Director of World Weather Watch Department of WMO, welcomed CIMO-MG members and wished them a constructive and successful session.

#### 1.2 Adoption of the agenda

1.2.1 The meeting adopted the Agenda as reproduced [at the beginning of this report](#).

#### 1.3 Working arrangements for the session

1.3.1 The session determined its working hours and the participants were informed on the local arrangements.

### 2. EVALUATION OF THE PROGRESS ACHIEVED IN THE WORK PROGRAMMES

#### 2.1 Report of the Acting President on EC-LVI

2.1.1 The acting President recalled that at CIMO-XIII, September/October 2002, he had been re-elected as vice president. In June 2003 at Fourteenth WMO Congress, the president of CIMO, Dr. Srivastava, had resigned on this position. Subsequently Dr. Canterford became acting President and Dr. John Nash, UK Met Office, was elected vice president of CIMO by a correspondence vote.

2.1.2 Dr. Canterford provided detailed information on the report that he had presented during the EC-LVI (June 2004), such as the work of the WMO Instruments and Methods of Observation Programme during the past year, the effectiveness of the new CIMO structure for the enhanced management of CIMO activities, major achievements and future plans. He mentioned that the new CIMO structure and the support of the WMO Secretariat had resulted in an increased effectiveness and range of activities of CIMO in support of WMO Members' needs. He mentioned significant progress that had been made in the areas of standardization, training and capacity building.

#### 2.2 Reports of the OPAG Co-Chairs

##### OPAG-SURFACE

2.2.1 Dr. van der Meulen and Dr. Richter reported on the activities of the expert teams under their responsibilities. They also made suggestion on how to improve managing working plans, CIMO publications, instrument intercomparisons, and how to address cross-cutting issues and improve working mechanisms. More details are in Doc.2.2(4): <http://www.wmo.int/web/www/IMOP/meetings/MG-2/DocPlan.html>.

2.2.2 The outcome of the first session of the ET on Surface Technology and Measurement Techniques (ET-ST&MT), Geneva, 13-16 October 2004, its subsequent activities and discussion during the CIMO-MG-2 were summarized as follows:

- i. The meteorological community is entering an era when a diverse collection of automatic observations will become readily available to users when and where needed. Included in national networks there will be many automatic in situ mesoscale networks, including automatic road and urban stations. Present weather, usually observed, described and reported by a human observer with a high degree of subjectivity, will be increasingly determined by automatic and unattended equipment. However the development of such complex equipment is a challenging exercise unless alternative weather information sources are found. Not only technological restrictions but also cost-effectiveness are the leading constraints when designing modern measurement systems. Guidance in terms of cost/benefit is found extremely welcome. Measurements in harsh environment near road and in urban areas are also in focus today. Determining appropriate siting and exposure is another challenge in those areas. Within this context, metadata, presented in a uniform format is an essential requirement for the interpretation of measured data. Reliable data and acceptable measurement uncertainty can only be guaranteed by appropriate quality management systems and training, issues well recognized by the surface measurements community.
- ii. The expert team initiated an action to develop standards for automated subjective observations. It was recognized that such standards would depend on available and also possible future technologies, which would provide alternative information on the present weather. As the defining or selecting standard algorithms would not be feasible because of the variety of observing techniques, it was decided to develop recommendations for further harmonization and uniformity.
- iii. In order to review the state-of-the-art of instruments and surface observing systems, the ET decided to continue with updating the Instrument Development Inquiry (IDI). Only those developments should be covered, which are not already part of the Instrument Catalogue. Future IDIs should be accessible through CIMO/IMOP website that would providing the advantage of more frequent updating.
- iv. Special attention will be given to development of guidelines for practices in harsh environment (icing, deserts, tropics, oceans) and to further develop siting criteria and metadata standards. Because of changing requirements and developing technologies, the table on Operational Uncertainties and Instrument Performances was updated and will be published in the CIMO Guide.
- v. Areas of special interest are observations for road and urban meteorology, because guidance material on how to perform such measurements is limited and harmonization is required. New available material will be published and the relevant chapters in the CIMO Guide updated.
- vi. The ET will also work on issues such as the Quality management and the development of training material in collaboration with the HMEI.
- vii. During the discussion on this item, it was agreed that more work should be done by the team on siting standards and standardization of AWS platform and that the work plan of the ET should be updated accordingly.

- viii. It was noted that the continuous restructuring of NMHSs affect predominantly instrument sections, especially instrument development which in turn contributes to the pronounced lack of the expertise available in the NMHSs. Therefore, the CIMO-MG will have to address the problem of how CIMO should work in the future. It was, however, clear that close collaboration with the HMEI and instrument manufacturers is a logical way to go.

2.2.3 The outcome of the joint meeting of the ET on Surface-based Instrument intercomparisons and Calibration Methods (ET-SBII&CM) and International Organizing Committee (IOC) on Surface-based Instrument Intercomparisons, Trappes, France, 24-28 November 2003, their subsequent activities and discussion during the CIMO-MG-2 were summarized as follows:

- i. The ET/IOC addressed both operational and organizational aspect for WMO Laboratory Intercomparisons of Rainfall Intensity (RI) Gauges, WMO Field Intercomparisons of RI Measuring Instruments and WMO Intercomparison of Thermometer Screens/Shields in conjunction with Humidity Measurements.
- ii. The ET/IOC defined the main objectives, possible places, dates and duration of the intercomparisons. Also operational aspects were discussed in details, namely conditions for participation, type of instruments, intercomparison rules, responsibility of host(s) and participants, data acquisition, processing analysis methodology and publication results.
- iii. The WMO Laboratory Intercomparison of Rainfall Intensity Gauges was launched, simultaneously, in September 2004, in the laboratories of the Royal Netherlands Meteorological Institute, Météo-France and the Italian Met Service (University of Genova). The selected 19 pairs of instruments from 18 manufacturers were divided into three groups, with each group being tested for a period of about three months in each of the laboratories, in order to obtain a high degree of confidence in the results. The first phase of tests has been successfully concluded by 15 February and the second by 15 May 2005, the last - third phase is expected to end in mid-2005. The chairman of the ET/IOC, the Project and Site managers met on 17 January 2005 in Genoa to assess outcome of the first phase and to adapt the Procedures for data analysis and processing and Presentation of the results based on the experience from the first phase. The preliminary results from the first phase would be presented at TECO-2005.
- iv. The consultations are going on with the Italian Air Force Centre of Aeronautical Experimentation (RESMA), a possible host of the WMO Field Intercomparison of Rainfall Intensity Gauges in their testing ground in Vigna di Valle, Italy. The evaluation of the infrastructure and technical support available at the test ground was successful, however the final decision of the IOC on the suitability of the Vigna di Valle test ground is pending the climatological statistics of the site that should be prepared by the end of May 2005 by RESMA.
- v. As for the WMO Intercomparison of Thermometer Screens/Shields in conjunction with Humidity Measurements, at least two test sites will be necessary. One in an arctic region and one in tropical or desert regions, the main interest being warm temperature and high solar radiation, as a combination of different conditions, e.g. warm/hot humid region, warm/hot dry region, cold region. Further efforts should be made to identify suitable locations for this field intercomparison.

- vi. During the discussion on this item, the CIMO-MG appreciated the support provided by the hosting laboratories to the WMO Laboratory Intercomparison of RI Gauges and requested the Secretariat to organize a meeting of the Project and site managers immediately after the third phase to evaluate the results and validate them for further analysis.

2.2.4 The meeting of the ET on Meteorological Radiation and Atmospheric Composition Measurements (ET-MR&ACM) is preliminary planned for early 2006.

- i. The meeting concentrates its activities on providing technical/scientific guidance in the establishment and continuing quality assurance of the World Infrared Radiometer Calibration Center (WIRCC) in Davos and on the Tenth International Pyrheliometer Comparison (IPC-X) and conjoint Regional Pyrheliometer Comparisons (RPC) to be held from 26 September to 14 October 2005 in the World Radiation Centre (WRC), Davos, Switzerland
- ii. The invitation to IPC-X was distributed to Members and institutions concerned on 15 February 2005. So far, 48 participants have been registered, representing 16 Regional Radiation Centres, 22 National Radiation Centres (NRCs) and 5 other institutions.
- iii. During the discussion on this item, it was suggested that for securing the RPCs conjointly with IPC-X, there is a need to support as far as possible all NRCs in need.
- iv. It was also suggested to organize first session of the ET before or after the IPC-X to take an advantage of the all but one team member being present in the IPC-X.

## **OPAG-UPPER AIR**

2.2.5 Mr. Dombrowsky, Dr. Ivanov and Dr. Nash reported on the activities of the expert teams under their responsibilities.

2.2.6 The outcome of the first session of the ET on Upgrading the Global Radiosonde Network (ET-UGRN), Geneva, 3-7 November 2003, its subsequent activities and discussion during the CIMO-MG-2 were summarized as follows:

- i. The ET was tasked to review the GUAN architecture from the perspective of international goals, including its structured process for the collection, documentation, data verification, and validation of user requirements. This process is needed to reconcile the mission of the GUAN with all other activities and operations within the WMO. Only through cross Commission review and discussion can requirements and resulting systems or system upgrades and solutions to be evaluated in terms of cost and effectiveness.
- ii. The first step to ensuring success is in the validation of operational and research requirements. Both the Climate community and the AMDAR Panel expressed a need for CIMO assistance in establishing sensor accuracies and to investigate how different tropospheric monitoring systems may be used in a complementary fashion. Such an approach would help in filling data gaps and eliminating duplication, while reducing costs through greater efficiencies in operation.

- iii. The ET prepared number of reports on the performance of radiosonde types in the GOS. In this regard, it updated the WMO Catalogue of Radiosondes (2004), reviewed radiosonde types and the associated table used in the TEMP code, completed the upper-air monitoring statistics for 2004 and provided summaries on the use of RS-80 radiosondes worldwide and sites that have equipment not easily upgraded to use the RS-92 to determine any impact.
  - iv. The team members have been working with HMEI and Members to determine the best approach to soliciting approval for a BUFR code table and descriptors and a survey document was prepared for determining measures needed to reduce the cost of operating upper-air networks.
  - v. The coordination goes on with the AMDAR Panel on issues related to the introduction of humidity measurements in AMDAR Systems.
  - vi. There are several efforts underway the development of technical information for support of radio frequency sharing policy for WRC. Through input from members of the ET-UGRN, the CBS Steering Group on Radio Frequency Coordination (SG-RFC) contributed to the development of an International Telecommunications Union (ITU) recommendation that addresses the need for spectrum sharing between radiosonde and meteorological satellites in the band 1675-1710 MHz.
  - vii. At its September 2004 meeting, the CBS SG-RFC did consider the ET-UGRN Work Plan action item on objectives for spectrally efficient radiosondes. In response to the ET action item the SG-RFC developed a guidance document that provides additional information on the need for spectrally efficient radiosondes, and provides the ET-UGRN additional guidance on what should be considered when developing a standard.
  - viii. The ET addressed the issue of reference radiosondes and concluded that the development of a fully capable reference radiosonde has not been successfully achieved. The ET, therefore, proposed that a designation of "High Quality Radiosonde" be adopted for the best new generation of operational radiosondes and for systems. Once developed it would be necessary to indicate the accuracy achievable by the different systems and also the limitations of the different systems. Users would then be able to identify suitable combinations of systems to provide the measurement quality required. Further progress on this issue relates to the outcome of the WMO Intercomparison of High Quality Radiosonde Systems, held in Vacoas, Mauritius, 1-27 February 2005, which suggested Vaisala and Sippican as the two most suitable radiosonde temperature measurement systems for climate monitoring both day and night.
  - ix. During the discussion on this item, the integration of AMDAR Programme into WWW operations was discussed. In this regard, CBS-XIII appointed a Rapporteur on AMDAR Matters to follow-up steps to fully integrate AMDAR into WWW operations. It was noted that AMDAR as the instrument based Programme closely relates to CIMO/IMOP.
- 2.2.7 The outcome of the first session of the Joint meeting of the Expert Team on Upper-Air Systems Intercomparisons (ET-UASI) and International Organizing Committee on Upper-Air Systems Intercomparisons (IOC), Geneva, 17-20 March 2004, their

subsequent activities and discussion during the CIMO-MG-2 were summarized as follows:

- i. The ET reviewed the progress in the development of high quality upper-air measurements of temperature and water vapour and the requirements for further tests/intercomparisons. It agreed that efforts would need to be made to link developments of new radiosonde systems in China, India and Russia, and in the short-term this might be best performed by comparisons in these countries against radiosonde systems designated as High Quality following the Mauritius test. A suggested standard for high quality might be temperature accurate to 0.3 K (all heights), relative humidity accurate to 5 % (temperatures down to -60°C in the troposphere), and winds accurate to 0.5 ms<sup>-1</sup> (all heights).
- ii. The team assessed the compatibility of radiosondes based on the report of a Rapporteur. For a given radiosonde station, the systematic bias averaged over 3 months between Vaisala RS80 radiosonde geopotential and first guess forecast at 100 hPa was usually within about ± 20 m of the average value for this radiosonde type. Twenty meters in 100 hPa geopotential corresponds to a range of ± 0.3 K in layer temperature from the surface to 100 hPa. The Meisei RS2-91 had similar consistency. Russian and Chinese radiosonde measurements mostly fell within a range of ± 35 m for the radiosonde type, corresponding to about ± 0.5 K range in layer temperature. The same evaluation for Indian radiosonde measurements shows a range of about ± 120 m between stations corresponding to about ± 2 K in layer temperature.
- iii. The ET is developing the performance measures to demonstrate the continuous improvement in the quality of upper-air observations. This requires to “elaborate global criteria for tracing the improvements, based on previous intercomparisons and recent radiosonde development, and including remote sensing”. In the first draft it was proposed to focus on the definition of appropriate criteria, which should later be used by the CIMO, the National Meteorological and Hydrological Services, and the manufacturers in order to trace the quality improvements in the radiosondes and upper-air observations.
- iv. The WMO Intercomparison of High Quality Radiosonde Systems, held in Vacoas, Mauritius, 1-27 February 2005, was vital for the worldwide and regional homogeneity of upper-air measurements. Six operational radiosonde systems (Vaisala, Sippican, Modem, MEISEI Electric Co., Graw Radiosondes and Meteorlabor) participated in the intercomparison, which consisted of 62 successful comparison flights. In addition Sippican MKII, 3 thermistor radiosondes were flown to provide a daytime “working reference” for temperature and the Snow-white chilled mirror hygrometer as a “working reference” for dewpoint/relative humidity. The objectives were met; the project team is analyzing the results and preparing a final report. The preliminary report is available on the CIMO/IMOP website (<http://www.wmo.int/web/www/IMOP/reports.html>), the Executive Summary will be ready by the end of May and the Final Report in Autumn 2005.
- v. The WMO Upper-Air Systems Intercomparisons in Mauritius was found a unique opportunity for COST-720 Action to test ground-based remote-sensing systems against the high quality radiosondes. COST Office decided to participate in the intercomparison with cloud radar, CT75K ceilometer and GPS WV sensor. Data gathered during the intercomparison by the remote sensing instruments will be compared to 62 average profiles of temperature, humidity and wind from radiosonde flights. Also 27 profiles of temperature and humidity were received from Challenging Mini-Satellite Payload Data (CHAMP) for the Comparison with

radiosonde data. Radiosonde average profiles as well as the remote sensing data and satellite data will be freely accessible from the ETH University website.

- vi. During the discussion on this item, it was pointed out that the lack of both financial and human resources had obstructed the organization of costly intercomparisons, such as the one in Mauritius that cost over CHF 1 million. The MG appreciated the effort of the Secretariat who could manage to organize the WMO Intercomparison of High Quality Radiosonde Systems in spite of the fact that the WMO Congress and EC-LVI did not allocate financial resources to the WMO intercomparisons. It also appreciated the huge contribution put in this intercomparison by the UK Met Office, the host country and the instrument manufacturers. It was also agreed that the collaboration between WMO and COST in Mauritius exercise had been mutually beneficial and it should be followed in the future as it uses cost efficiently the available resources.

2.2.8 The outcome of the first session of the Expert Team on Remote Sensing Upper-Air Technology and Techniques (ET-RSUAT&T), Geneva, 14-17 March 2005, its subsequent activities and discussion during the CIMO-MG-2 were summarized as follows:

- i. The ET was tasked by CIMO to review the ground-based remote sensing technologies and techniques used in upper-air monitoring, their accuracies and potential for future integration. The review of the current technology and networks of GPS water vapour, wind profilers, Doppler radars and lightning detection system was done during the first ET session.
- ii. The ET addressed the issue of integrating profiling systems and other upper-air measurement techniques and suggested that the integration can be accomplished on either of two levels; the first approach is the combination of systems to improve one single meteorological parameter such as wind, temperature, humidity or cloud parameter. This could be achieved through improved vertical resolution, vertical coverage and/or data quality. The second approach to integration could be through the identification of new parameters using the synergy derived between two or more systems. This could be achieved through simultaneous evaluation of multiple remote sensing techniques. In the latter case, the simultaneous use and evaluation of cloud radar, microwave radiometer and lidar (ceilometer) could lead to microphysical cloud property profiles, which cannot be derived reasonably using one single profiling system.
- iii. A number of projects for the integration of different ground-based observing techniques are going on, such as WINPROF, CWINDE, TUC, CMOST, COST-74 and COST-76, and it is important that WMO monitors them and facilitates the exchange of information among "isolated" communities. The ET provides an excellent platform for it.
- iv. The ET is also developing a guidance material on the operational aspects of different ground-based remote sensing techniques for vertical profiling. Drafts were presented during the ET meeting.
- v. In the discussion, the CIMO-MG addressed the request made by the NOAA/GCOS Workshop to Define Climate Requirements for Upper-Air Observation, Boulder, USA, February 2005, for CIMO to take lead in a second workshop. In this regard, DR Canterford and Dr Ondras would serve as members of the steering committee for the organization of a second workshop.

## OPAG-CB

2.2.9 Mr. Bazira and Mr. Zhou reported on the activities of the expert teams under their responsibilities. None of the three ET under this OPAG held their meeting so far.

2.2.10 The first session of the ET-ST&MT, Geneva, 13-16 October 2004, had a training component to address the issue of the ET on Training Activities and Training Material (ET-TA&TM). The outcome of this meeting, the ET-TA&TM activities and discussion during the CIMO-MG-2 were summarized as follows:

- i. ET discussed the possibilities of preparing training materials in classical form or in computer aided learning. Many meteorological services are not in a position to assist in the development of training material, as they no more provide specialized instrument training to their own staff. It was suggested that CIMO Web Portal be more used to link different site for available training material including those of manufacturers. HMEI representatives were asked to provide such links.
- ii. Meteorological Instruments are continuously changing due to improvements in technology. Therefore, training of trainers or operational managers would enhance the knowledge and skills of the technical personnel to ensure effective operation and maintenance of the equipment as well as the quality of the observations. Simple manuals and maintenance procedures would assist the operational personnel to maintain equipment in good working condition. Therefore, manuals provided by manufacturers as well as documents like CIMO Guide could assist the operational and technical personnel to improve their knowledge and skills in equipment maintenance. Therefore, the CIMO Guide should be regularly updated.
- iii. Some training material was provided by the UK Met Office and DWD for the ET to consider their suitability for wider use by. The UK material was rejected and the DWD material is under the assessment.
- iv. Two Training Workshops on Upper-air Observations for RA I were organized for English and French speaking African countries (Gaborone, Botswana, 7-11 April 2003 and Casablanca, Morocco, 1-5 December 2003), The Training Workshops were aimed at improving the knowledge and skills of senior operational personnel in-charge of the national upper-air networks. They had both theoretical and practical lessons. The theory covered topics, such as basic introduction to radiosonde soundings and presently used technology and procedures before launching radiosondes. A review of presently used technology was complemented by information on possible future systems, such as wind profilers, RASS and radiometers. A set of the guidance and training material was provided to participants on a CD to assist them in the follow-up training at national levels. Fifty-five persons were trained at the two Workshops
- v. In collaboration with the Turkish State Meteorological Service, the Training Course on Automated Weather Observing Systems will be organized in Alanya, 6-10 June 2005. WMO will cosponsor this event.
- vi. During the Tenth International Pyrheliometer Comparison, (IPC-X), a workshop related to the radiation instruments and radiation measurements will be organized for participants.
- vii. The Training Workshop on Metrology for the RICs will be held in Trappes, France from 17 to 21 October 2005. The training material will be developed for the

workshop in French and English will be also used in the follow-up workshops for the NMHSs.

- viii. The Training Workshop on Upper-air Observations for RA III is under preparations and will be held in May 2006 in Buenos Aires, Argentina. The workshop will be conducted in English and simultaneous interpretation would be provided into Spanish. UK Met Office and Argentina would provide lecturers and available training material will be translated into Spanish. Four manufacturers showed their interest to take part in the workshop and would provide their ground systems for the practical part of the training.
- ix. During the discussion, the Dr Ivanov suggested that available training material in Russian could be translated into English. Dr. Ivanov will inform the Secretariat on further steps and requirements to achieve it.

2.2.11 The Expert Team on RICs, Quality Management Systems and Commercial Instruments Initiatives concentrates its work on further strengthening the RIC, especially those in developing countries, to better assist Members of the Region in providing services as defined in their Terms of Reference. In this regard, RICs are being evaluated by an expert from the RIC Trappes, France and proposals further strengthening of the RICs will be developed.

2.2.12 The Expert Team on CIMO Guide and Information Dissemination is participating in the update of the CIMO Guide and preparation of its new 7<sup>th</sup> edition. Dr. Zhou informed the CIMO-MG that the World Meteorological Instrument Catalogue is again accessible through CMA website and that the new version (2005) is under preparation.

### **3. ISSUES RELATED TO PLANNING, COORDINATION AND MANAGEMENT THE WORK OF THE COMMISSION, ITS OPEN GROUPS AND EXPERT TEAMS**

#### **3.1 Review of the Working Structure of CIMO including membership**

3.1.1 The CIMO-MG considered the development of NDPM and GEO/GEOSS Programmes and agreed upon its way to interact with NDPM ([see item 4.1](#)) and GEOSS ([see item 4.2](#)) Programmes. This has an implication to CIMO Working Structure.

3.1.2 Dr. Carolin Richter, Germany resigned from the position as CIMO-MG member as well as Co-chairperson of the OPAG-SURFACE due to her new assignment in the German Ministry of Transport, Building and Housing. The CIMO-MG congratulated Dr Richter on her new assignment and expressed its gratitude for all the work done by Dr. Richter on CIMO matters.

3.1.3 The CIMO-MG reviewed the working structure of CIMO as stated in the Resolutions 1, 2 and 3 (CIMO-XIII) and agreed on adjustments needed to ensure the effective management of CIMO expert teams and to tackle specific issues related to GEOSS and NDPM. In this regard, the CIMO-MG decided to enlarge the composition of the CIMO-MG by GEOSS and NDPM coordinators and to replace Dr Carolin Richter, Co-chairperson of OPAG-SURFACE, by DR. K. H. Klapheck (Germany)<sup>1</sup>. In this respect, the acting president of CIMO approved the revision of Resolutions 1, 2 and 3 (CIMO-2005). ([See Annex II](#)). The CIMO Members will be informed on these changes by a separate letter.

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<sup>1</sup> Pending the concurrence of the Permanent Representative of Germany with WMO

3.1.4 Based on the detailed discussion of current experience with the working mechanism, the CIMO-MG agreed to further improve it and suggested that a document on the Role of the MG and ETs would initiate needed discussion before the CIMO-XIV that should turn into a working document for the CIMO-XIV. Mr Dombrowsky volunteered to prepare this document.

### **3.2 Review of the TOR of OPAGs and ETs**

3.2.1 The CIMO-MG was informed that all expert teams have developed their Work Plans taking into account Preliminary TOR (Annex to paragraph 13.7 of the CIMO-XIII Abridged Final Report, WMO-No. 947). These work plans (<http://www.wmo.int/web/www/CIMO/cimo13-WorkPlan-ETs.html>) were approved by the CIMO-MG and thus constitute the revised Terms of Reference of OPAGs.

### **3.3 Review of the Milestone Plan of CIMO activities and meetings**

3.3.1 The CIMO/MG reviewed the CIMO Activity Plan and proposed some adjustments. The new Activity Plan is in [Annex III](#).

### **3.4 Other pertinent issues**

#### **3.4.1 Intercomparisons**

3.4.1.1 The report on the ongoing and planned intercomparisons were provided to CIMO-MG by OPAG Co-chairpersons in their reports (see items [2.2.3](#) and [2.2.7](#)). Further, Dr Canterford and Mr Dombrowsky volunteered to assist the ET-SBII&CM in identifying suitable locations in Australia and USA for the planned field intercomparisons.

3.4.1.2 Dr Zhou indicated the preparedness of China to organize Regional Radiosonde Intercomparison in the next 2 years to link the Chinese radiosondes to the High Quality radiosondes tested in Mauritius. Similarly, Dr Ivanov indicated willingness of Russia to organize such a regional intercomparison in the near future, in which case intercomparison would be extended to cover some remote sensing instruments.

3.4.1.3 The CIMO-MG requested the Secretariat to facilitate as far as possible organization of urgently needed intercomparisons as planned by CIMO-XIII.

#### **3.4.2 Flexible Upper-air Systems**

3.4.2.1 The CIMO-MG was briefed on the development in flexible upper-air systems and the activities done by the ET-UGRN and the ET-UASI.

3.4.2.2 InterMet IMS 1600 Integrated Upper-air System was installed in Dar Es Salaam in October 2004, funded under GCOS project. This is a 1680 MHz RDF combined with 403 MHz GPS system. The Sippican and Modem radiosondes are used with the system. A demonstration test was performed by a joint UK Met Office and NOAA-NWS team on behalf of WMO/GCOS. The test revealed number of problems (see Doc.3.4.2: <http://www.wmo.int/web/www/IMOP/meetings/MG-2/DocPlan.html>), many of them already fixed by the manufacturer. After most of the initial problems were solved, there are promising reports from the Tanzania Met Service on the operational use of IMS 1600 system. Under projects funded by GCOS a system similar to Dar Es Salaam (however, without 403 MHz mode) was already purchased for Namibia and one system is planned for Zimbabwe.

### **3.4.3 CIMO Guide**

3.4.3.1 The assessors and reviewers have concluded their work on the revision of the sixth edition of the *CIMO Guide*. The work started after CIMO-XII (1998) and some 42 experts from 17 countries participated in the work. 28 out of 32 chapters were updated and two new chapters drafted. CIMO-MG approved them for publication and they should be submitted to the WMO's Conference, Printing and Publication Department by the end of May 2005 for language proofing, updates of graphs and pictures, formatting and printing. Electronic version of *CIMO Guide* in English should be out in mid 2006, hardcopy version in late 2006.

3.4.3.2 The CIMO-MG agreed that the update of the *CIMO Guide* should be a continued activity, the Expert Team on CIMO Guide and Information Dissemination being responsible for it. In this regard, a decision has to be made on the need to up-date and restructure the Part III "Quality Assurance and Management of Observing Systems" with respect to quality management guidelines and ISO standards. Dr. Richter agreed to look for a resource person to update Part III accordingly.

### **3.4.4 IOM Reports**

3.4.4.1 Seven IOM Reports were already published since CIMO-XIII on the CIMO/IMOP website and/or CD ROMs. All of them were approved for publication by the acting president of CIMO. The already published and those planned are in [Annex IV](#).

3.4.4.2 CIMO-MG stress that the important deliverables of the CIMO expert teams should also be published as IOM Reports based on the proposal of the expert team chairpersons and the approval by the acting president of CIMO.

## **4. INTERACTION WITH WMO CROSS-CUTTING ACTIVITIES**

### **4.1 Natural Disaster Prevention and Mitigation Programme (NDPMP)**

4.1.1 The Secretariat informed the CIMO-MG on the activities related to WMO's Natural Disaster Prevention and Mitigation Programme (NDPM) based on the document provided by Dr. M. Golnaraghi, Chief of DPM. This included: i) Coordination of WMO activities for the World Conference on Disaster Reduction; ii) Development of promotional materials for WMO activities in Disaster Reduction; iii) Coordination and development of WMO's strategy and proposals in response to the Asian Tsunami Disaster and related resource mobilization; iv) Initiation of the Coordination activities of DPM within WMO Secretariat; v) Activities related to TCs and RAs; vi) Activities to evaluate potential partnerships among international and regional organizations, initiatives and programmes; vii) Relations with the private sector users; and WMO's activities related to Tsunami Early Warning System in the Indian Ocean and other regions at risk.

4.1.2 The CIMO-MG decided to establish the CIMO NDPM Coordinator (see also [item 3.1.1](#)). The coordinator will address the following issues:

- In working with the Secretariat (Chief DPM) and based on the DPM Program strategy (perspective, challenges and deficiencies), identify areas that can be addressed effectively by CIMO;
- Identification of examples of past disasters where there were failures and

weaknesses in our instrument systems (through request of the post disaster assessments and other information that might be shared through the regional centres and countries);

- Identify those areas where CIMO can contribute addressing the gaps and deficiencies;
- Consult with OPAG Chairs to highlight when CIMO has actions in progress or planned to address the gaps and deficiencies;
- Assist OPAG Chairs in drawing attention to achievements or needs in respect of NDPM;
- Work with the Secretariat (Chief DPM) to promote CIMO achievements on NDPM.

4.1.3 CIMO-MG considered Mr R. Dombrowsky to assume the responsibility of CIMO NDPM Coordinator<sup>2</sup>.

#### **4.2 Global Earth Observation Systems of Systems (GEOSS)**

4.2.1 The Secretariat informed the CIMO-MG on the activities related to GEOSS based on the document provided by Dr D. Hinsman, Chief WMO Space Programme Office and Group on Earth Observation (GEO) Focal Point, namely on the present state of implementation of the GEO Secretariat and on its expected developments until 2006, on the GEO 10-year implementation plan (GEO 10Y-IP) and goals. It was pointed out that the GEO 10Y-IP provide good background information on how it is planned to interact with existing systems. It was noted that each Technical Commission could have GEOSS Coordinators. As the CIMO/IMOP could have an important contribution to GEO/GEOSS, CIMO/IMOP and GEO/GEOSS would have to interact and be informed on what they are respectively doing. An investigation will be needed to determine if the CIMO 6LTP and the GEO implementation plan are in agreement and compatible.

4.2.2 The CIMO-MG decided to establish the CIMO GEOSS Coordinator (see also [item 3.1.1](#)). The Coordinator should, in consultation with the OPAG Co-chairs, produce a proposal on how CIMO could best interact with GEO/GEOSS. This proposal will be submitted to the CIMO-MG for endorsement. The Co-coordinator is expected to study the GEO 10Y-IP (10-year Plan) and the proposed GEO working mechanisms as well as CIMO Plans (LTP and Work Plans) in the process of drafting his proposal that should be ready by the end of 2005 for the CIMO-MG review.

4.2.3 CIMO-MG considered Mr R. Dombrowsky (USA) to assume the responsibility of CIMO GEOSS Coordinator<sup>3</sup>.

#### **4.3 WMO Quality Management Framework (QMF)**

4.3.1 The Secretariat informed the CIMO-MG on the activities related to WMO QMF. In addition the acting president reported on the Workshop on QM in Kuala Lumpur, Malaysia, October 2004.

4.3.2 In view of the activities planned by the PTC-2005 to review WMO technical standards to remove inconsistencies, duplications, etc., the CIMO-MG decided to perform necessary action to ensure that the *CIMO Guide* is up-to-date and, where there is overlap with other WMO Manuals and Guides, to ensure no inconsistencies remain. The CIMO-MG consequently agreed to ensure, as a first step, that consistency is

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<sup>2</sup> Pending the concurrence of the Permanent Representative of USA with WMO

<sup>3</sup> Pending the concurrence of the Permanent Representative of USA with WMO

achieved between the *GOS Manual* and *GOS Guide* and the *CIMO Guide*. The MG requested the Secretariat to assist in identifying resource persons.

- 4.3.3 In order to better respond to the requirements related to quality management issues, the CIMO-MG decided to establish a Rapporteur on Quality Management who would also represent CIMO in various meetings and expert team organized/established by WMO. Dr Richter and Mr Dombrowsky would assist the CIMO-MG in identifying an appropriate expert to assume this position. Till then, the acting president would take the responsibility.

## **5. ANY OTHER BUSINESS**

- 5.1 The CIMO-MG discussed the organizational aspects of next CIMO Session, TECO and METEOREX. The Secretariat informed that, in the absence of the official invitation by WMO Members, the conference facilities had been booked for CIMO-XIV in the WMO HQ in Geneva, for the period in the beginning of December 2006. The CIMO-MG agreed that if CIMO-XIV would be held in Geneva, the METEOREX would not be organized due to the proximity of another exhibition (METEOHYDEX) organized alongside the Fifteenth WMO Congress in May 2007.
- 5.2 Taking into account the time that could be gained by the new style of documentation, the CIMO-MG agreed to shorten the CIMO session by 1 ½ day (from 7 ½ to 6 working days) comparing to CIMO-XIII. At the same time it agreed to extend TECO-2006 by ½ day (from 2 ½ to 3 days). The TECO should start first and be followed by CIMO-XIV so that the weekend would be included in the session to provide time needed for the translation of working papers or PINKs (at least two working days of the session would be placed after the weekend). The CIMO-MG has discussed other possibilities to reduce further the period of CIMO-XIII session with a possibility to convert the savings to CIMO activities, such as intercomparisons. The Geneva scenario would then be: TECO-2006 from 5 to 7 December 2006 and CIMO-XIV from 8 to 14 December 2006.
- 5.3 Dr Ivanov has informed that Russian Federation might consider hosting CIMO-XIV, TECO-2007 and METEOREX-2007 in St. Petersburg in February 2007. Taking into account the time available, it is imperative that Russia submits the official invitation not later than October 2005.

## **6. CLOSURE OF THE SESSION**

- 6.1 Dr Canterford thanked the participants for their active work and their valuable contributions towards the successful outcome of the session. He also thanked the WMO Secretariat and the Romanian National Meteorological Administration for the excellent support provided before and during the session.
- 6.2 Mr Schiessl thanked the Management Group members for their active participation during the session.
- 6.3 The session closed on Tuesday, 3 May 2005 at 17:00 hours.

## LIST OF PARTICIPANTS

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**Resolution 1 (CIMO-2005) – WORKING STRUCTURE OF THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION**

**THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION,**

**RECALLING** the Resolution 1 (CIMO-XIII) - WORKING STRUCTURE OF THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION,

**CONSIDERING** the continuing need to ensure effective management of the work of the Commission and the need to cooperate and to contribute to the new established programmes,

**DECIDED** to modify Resolution 1 (CIMO-XIII) as follows:

...

Annex to Resolution 1 (CIMO-XIII): Replace the first sentence of the paragraph 4 (CIMO-MG) with: "The CIMO MG shall consist of the president and vice-president, the co-chairpersons of the three OPAGs, along with the minimum additional experts needed to address WMO major issues and/or to ensure regional representation."

**Resolution 2 (CIMO-2005) – COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION MANAGEMENT GROUP**

**THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION,**

**RECALLING** the Resolution 2 (CIMO-XIII) - COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION MANAGEMENT GROUP,

**CONSIDERING** the continuing need to ensure effective management of the work of the Commission and the need to cooperate and to contribute to the new established programmes,

**DECIDED** to modify Resolution 2 (CIMO-XIII) as follows:

...

Decides (2) add: “

(d) To invite ..... to serve as the Global Earth Observing System of Systems (GEOSS) Coordinator<sup>4</sup>

(e) To invite ..... to serve as the Natural Disaster Prevention and Mitigation (NDPM) Coordinator<sup>5</sup>

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<sup>4</sup> See item 4.2.2 for the TOR, the name will be coordinated with the proposed candidate, the respective Permanent Representative, and will be inserted in the final form of the resolution.

<sup>5</sup> See item 4.1.2 for the TOR, the name will be coordinated with the proposed candidate, the respective Permanent Representative, and will be inserted in the final form of the resolution.

**Resolution 3 (CIMO-2005) – OPEN PROGRAMME AREA GROUPS (OPAGs) OF THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION**

**THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION,**

**RECALLING** the Resolution 3 (CIMO-XIII) - OPEN PROGRAMME AREA GROUPS (OPAGs) OF THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION,

**CONSIDERING** the continuing need to ensure effective management of the work of the Commission and the need to cooperate and to contribute to the new established programmes,

**DECIDED** to modify Resolution 3 (CIMO-XIII) as follows:

...

DECIDES

(a) OPAG on Surface Observation Technology:

Replace:      Co-chairperson      C. Richter (Germany) by:  
                 •      Co-chairperson      ..... (.....)<sup>6</sup>

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<sup>6</sup> The name will be coordinated with the proposed candidate, the respective Permanent Representative, and will be inserted in the final form of the resolution

## CIMO Activity Plan

		2003				2004				2005				2006				2007			
		Quarter				Quarter				Quarter				Quarter				Quarter			
<b>A. OPAG-Surface</b>		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	ET on Surface Technology and Measurement Techniques							M													
2	ET on Surface-based Instrument intercomparisons & Calibration Methods			M																	
3	ET on Meteorological Radiation & Atm. Composition Measurements												M								
<b>B OPAG- Upper Air</b>																					
1	ET on Upgrading the Global Radiosonde Network			M																	
2	ET on Upper-air Systems Intercomparisons				M																
3	ET on Remote Sensing Upper-air Technology and Techniques								M												
<b>C OPAG- Capacity Building</b>																					
1	ET on Training Activities and Training Materials							A1													
2	ET on RICs, QMS and Commercial Instruments Initiatives												M								
3	ET on CIMO Guide and Inf. Dissemination																				
<b>Training and Capacity Building Events</b>																					
1	U/A Training Workshop, Botswana		W																		
2	U/A Training Workshop, Morocco			W																	
3	U/A Training Workshop, Buenos Aires												W								
4	U/A Training Workshop, RA II																				W
5	TECO										C									C	
6	Meeting of Heads of RICs														C2						
7	Training Workshop for Instr. Specialists											W				W				W	
<b>Intercomparisons</b>																					
1	IOC on Surface-based Intercomparisons			M					M			M				M					
2	IOC on Upper-air Systems Intercomparisons				M							M									
3	Lab. Intercomp.of RI Gauges, FR, IT, NL							I	I	I	I	I									
4	RSO Intercomparison, Mauritius								I												
5	IPC-X, RPCs, WRC Davos										I										
6	Field Intercomparisons of RI Gauges																			I	I
<b>Other Meetings</b>																					
1	CIMO-MG Meeting	M									M					M					
2	CIMO-XIV Session																			S	

-  = done or already committed
-  = planned and funded under P&B 2004-2007
-  = planned but not funded
-  = funded under ETR Programme

- C = Conference
- I = Intercomparison
- M = Meeting
- S = Session
- W = Workshop
- A1 = Training component with meeting of A1
- C2 = Joint meeting with C2 (not funded)

## CIMO-MG-1, ANNEX IV

## IOM Reports

No	IOM Report	Author	Status	Location	Published (Planned)
	<b>CIMO-XII related</b>				
1.	Evaluation of the AWS Algorithm Questionnaire	M. Gifford	IOM 78, TD 1160	CD and website	2003
2.	GPS Radiosonde Comparison – Brazil, Executive summary	R. Silveira et al.	IOM 76, TD 1153	CD and website	2003
3.	GPS Radiosonde Comparison – Brazil, Final report	J. Nash, R. Silveira	In preparation		(2005)
4.	Road Managers and Meteorologists on Road Meteorological Observations	J. Terprstra & T. Ladent	IOM 77, TD 1159	CD and website	2003
5.	Summary of the first five WMO Radiosonde Comparisons	J. Nash	In preparation		(2006)
6.	Compatibility of Radiosonde Geopotential Measurements	J. Elms	IOM 80, TD 1197	CD and website	2004
7.	7 <sup>th</sup> Edition of Instrument Development Inquiry	T. Prager	In preparation		(2005)
8.	Operational Aspects of Wind Profilers	J. Dibbern	IOM 79, TD 1196	CD and website	2004
	<b>CIMO-XIII related</b>				
9.	Initial guidance to obtain representative meteorological observations at urban sites	T. Oke	IOM 81, TD 1250	Website (CD planned)	2004
10.	Papers and Posters - TECO-2005		In preparation	CD and website	2005
11.	WMO Laboratory Intercomparison of rainfall intensity gauges	L. Lanza et al.	-		(2005)
12.	WMO Intercomparison of high quality radiosonde systems; Executive summary	J. Nash et al.	In preparation		(2005)
13.	WMO Intercomparison of high quality radiosonde systems; Final report	J. Nash et al.	In preparation		(2005)
14.	Guidance Material on the Choice of Meteorological Instruments for Surface Data Suitable for Use in Developing Countries	J. v.d. Meulen et al.	In preparation		(2005)
15.	IPC-X, Final report	W. Finsterle	-		(2006)
16.	8 <sup>th</sup> Edition of Instrument Development Inquiry	K. Hegg	-		(2006)