

WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION

**CIMO MANAGEMENT GROUP
Third Session**

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FINAL REPORT



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EXECUTIVE SUMMARY

The CIMO Management Group session MG-3 focused on finalizing planning for conducting TECO-2006 activities scheduled for 4-6 December followed by the CIMO Commission meeting 7-14 December. The membership of the management group discussed the various aspects of the pending commission meeting agreeing on the details regarding organization and documentation. Each OPAG member prepared and presented a concise report of each OPAG's activities bringing to the attention of the Management Group their achievements, future work recommendations and presentations for consideration and approval. The MG-3 discussed the future working structure of the Commission and prepared proposals that will be submitted to CIMO-XIV for consideration. These reports contained a summary of each OPAG's crosscutting collaboration with internal and external programs and commissions.

The management group received valuable presentations from representatives of WMO programs and the private sector including, Natural Disaster Prevention and Mitigation Program, Global Climate Observation Program, Quality Management Framework Program, Hydrometeorological Manufacturers Equipment Industry, and from the Secretary-General's Office a detailed briefing on the WMO strategic planning process. These excellent presentations were relevant to the proposed work of the OPAGs to be presented at CIMO XIV.

GENERAL SUMMARY

1. ORGANIZATION OF THE SESSION

1.1 Opening of the session

1.1.1 Dr R.P. Canterford, the Acting President CIMO, opened the third session of the CIMO Management Group (CIMO-MG) at 10:00 hours Monday, 3 July 2006. He welcomed the participants and wished them a pleasant stay in Geneva. The only member unable to attend was Mr H. Zhou. The list of participants is given in [Annex 1.1.1](#).

1.1.2 Mr J Lengoasa, Assistant Secretary General, followed with a welcome on behalf of the Secretary-General. Mr Lengoasa welcomed the group, which was followed by comments relating to CIMO's unique and crucial contributions to WMO in its unique and crucial role in contributing to the welfare of humanity. He closed his remarks by wishing the members 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 core 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-LVIII

2.1.1 Dr Canterford reported that his presentation to EC-LVIII, June 2006, began with a summary of the excellent work undertaken by the Commission in the area of instrument Intercomparisons and the benefit brought to WMO Members. He started with the successful WMO Intercomparison of High Quality Radiosonde Systems, Vacoas, Mauritius, 2-25 February 2005. He briefly touched upon the following results:

- The identification of error characteristics of high quality radiosondes;
- The improved accuracy of high quality radiosonde systems;
- The usefulness of geopotential height derived from geometric height measured by GPS radiosondes;
- The identified best combinations of radiosondes for reference purposes; and
- The identification of performance areas for manufacturers to consider in development and quality improvements of radiosondes.

2.1.2 Dr Canterford also provided detailed information related to the successful surface-based instrument Intercomparisons. The WMO Laboratory Intercomparisons of Rainfall Intensity (RI) was held in the recognized laboratories of the Royal Netherlands Meteorological Institute, Météo France and the University of Genova from September 2004 to September 2005. The results included: (a) the Intercomparison showed that if the tipping-bucket gauges were equipped with proper correction software they provided quality rainfall intensity measurements, (b) the uncertainty is generally less for weighing gauges than tipping-bucket gauges, (c) reference instruments were identified for field intercomparisons, and (d) standardized procedure for laboratory calibration of catchment type of RI gauges were defined. He indicated preparations had begun for conducting the WMO Field Intercomparison of Rainfall Intensity Measuring Instruments in Vigna de Ville, Italy, from mid

2007 to mid 2008. Invitations were extended to manufacturers in March 2006 and final selection of instruments would be completed in July 2006.

2.1.3 Conclusions derived by CIMO ET/IOC included, 1) based on the information received from the RI Intercomparison it was felt that enough information was available to warrant intercomparing both catchment and non-catchment types of instruments with the emphasis on high rainfall intensity, 2) to conduct a WMO Intercomparison of Thermometer Screens/Shields with humidity measuring instruments.

2.1.4 The Tenth Pyrheliometer Comparison (IPC-X) included a joint symposium and hosted 72 participants from 16 Regional Radiation Centers (RRCs), 23 National Radiation Centers and 5 International Institutes. The conjoint training workshop provided RRC experts instruction on how to prepare, conduct, and evaluate the results of pyrheliometers comparisons.

2.1.5 Dr Canterford reported on the extensive work accomplished by the ET on Radiation and Atmospheric Composition Measurements. The ET met 6-10 February 2006 to finalize the results of world radiometric reference factors to regional and national standards and to evaluate the World Infrared Radiometer Calibration Centre. The group also discussed how to best to increase or strengthen the role of CIMO in the development of a Baseline Surface Radiation Network and how best to liaise with WCRP on common issues.

2.1.6 A report was provided on efforts to strengthen Regional Instrument Centers (RICs). The first step taken by the ET was to evaluate RICs, which led to in-depth discussions on how to improve RIC functionality, revise RIC Terms of Reference and development of a strategy for strengthening RICs.

2.1.7 Dr Canterford's capacity building summary reflected a significant amount of work had been accomplished by CIMO. This work included one training workshop on upper-air observations for RA III and four training workshops on metrology and calibrations for RICs, RA I and RA VI. Expert missions were organized to evaluate RICs with the view of how RICs could be strengthened. Work continued on updating the 2005 World Meteorological Instrument Catalogue including the preliminary steps to involve HMEI in future versions of the catalogue. He indicated great effort was taken in finalizing and preparing technical reports on Instruments and Observation Methods. Eleven IOM reports were identified as complete and these would be provided to CIMO Members on a CD ROM at the CIMO-XIV Session. The seventh edition of the CIMO Guide would reflect changes in 32 chapters and the creation of 2 new chapters.

2.1.8 In closing Dr Canterford provided a brief summary of CIMO's highest priority issues such as strengthening its links with relevant international organizations and expanding its role in support of other WMO programmes such as WMO Natural Disaster Prevention and Mitigation and Global Earth Observation System of Systems.

2.2 Report of the 2006 Meeting of Presidents of Technical Commissions

2.2.1 Mr J. Nash, Vice president CIMO, represented the Acting President at the meeting of Presidents. Mr Nash reported on numerous issues addressed by the presidents or their representatives.

2.2.2 The representatives of intercommission coordinating groups and Programmes reported on the status of various activities relevant to the technical commissions ranging from planned activities within the WMO Information System, the status of DPM, GEOSS, QMF, IPY, and WMO Strategic planning. The information presented by Mr Nash provided updated information that assisted the OPAGs in preparing their future plans as well as providing a baseline for the development of a CIMO Strategic Plan.

2.3 Reports of the OPAG Co-Chairs

2.3.1 Report of the OPAG-SURFACE (ET-ST&MT).

2.3.1.1 Mr van der Meulen reported on the activities of the expert team and discussed future plans of activities that would be carried forward into the CIMO XIV Intersessional period. He reported that the team concentrated all their effort on updating the CIMO-Guide.

2.3.2 Report of the OPAG-SURFACE (ET-SBII&CM)

2.3.2.1 Mr van der Meulen, on behalf of Mr M. Leroy, ET Chair, reported on the successful work conducted by the ET. During the CIMO-XIII intersessional period the ET prepared, organized and evaluated WMO Laboratory Intercomparisons of Rainfall Intensity (RI) Gauges (see also paragraph 2.1.2). 19 pairs instruments were intercompared in laboratories at three independent locations, DIAM (University of Genoa, Italy), KNMI (De Bilt, The Netherlands), and Météo France (Trappes, France). Project Leader for this effort was Mr L. Lanza. The results of the intercomparison focused on the selection of reference gauges for field intercomparisons, define a reference method for calibration of catchment type RI gauges and to identify error characteristics of the test gauges. This result in advise to manufactures on software or hardware corrections to TBG rain gauges and improvements in the response time of weighing gauges. See the CIMO/IMOP website for the Final report of the intercomparison: <http://www.wmo.int/web/www/IMOP/reports.html>

2.3.3 Since September 2005, the ET/IOC concentrated on the preparations for holding the follow-up Field Intercomparison of RI Gauges in Vigna di Valle, Italy, mid-2007 to mid-2008. Invitations and requests for proposals were sent to Members and HMEI. Proposals have been evaluated and participating instruments selected.

2.3.3 Report of the OPAG-SURFACE (ET-MR&ACM)

2.3.3.1 The IPC-X and the conjointly organized RPCs took place at the PMOD/WRC Davos between 26 September and 14 October 2005. An Ad-Hoc Group of experts in radiometry was established to oversee the procedures of IPC-X. The report was discussed during the first session of the ET-MR&ACM (Davos, Switzerland, 6-10 February 2006). See the CIMO/IMOP website for the Final report of the intercomparison: <http://www.wmo.int/web/www/IMOP/reports.html>.

2.3.3.2 The weather conditions were very favorable throughout the intercomparison. Measurements were taken on a total of 11 days, resulting in over 1000 data points for PMO2 compared to the minimum requirement of 150 points. The 77 participants from 42 countries operated a total of 101 instruments.

2.3.3.3 The World Radiometric Reference (WRR) is defined and calculated as the mean value of the simultaneous measurements of at least three WSG instruments. Each participating instrument was assigned a new WRR factor determined by averaging the ratios of the WRR to the instrument for all data points satisfying the data selection criteria specified in the Ad-Hoc Group report.

2.3.3.4 The non-attendance of some Regional Radiation Centres at IPC-X was of concern to the CIMO ET. This non-attendance hampers the traceability of irradiance measurements performed by these radiation centers, their associated national centers, and their role as radiation centers under CIMO. As a result, the ET felt that mechanisms and protocols be introduced into the CIMO Guide to ensure that a Regional or National Radiation Centre have traceability to the WRR. The ET reviewed Annex 7.C of the CIMO Guide to incorporate these mechanisms and protocols.

2.3.3.5 Following Recommendation 1 of CIMO XIII, the ET evaluated the World Infrared Radiometer Calibration Centre (IRC) established at the PMOD/WRC in January 2004. There is still some work to be done to ensure the Absolute Sky Scanning Radiometer (ASR) is an appropriate reference point for infrared measurements. The World Infrared Standard Group (WISG) will provide a useful interim reference for pyrgeometer far infrared measurements

until a long-term absolute reference can be established. To assist in assuring the stability of the WISG, the meeting suggested that carefully selected pyrgeometers outside the WISG are periodically be compared to the WISG.

2.3.4 Report of the OPAG UPPER-AIR (ET-UGRN)

2.3.4.1 The ET addressed the issue of the development of techniques and annual reports on the performance of radiosonde types in the GOS. Mr Tim Oakley of the UK Met Office supported these global activities through preparation of annual reports on radiosonde measurements. In his capacity as Rapporteur on Radiosonde Capabilities Mr Oakley maintained an excellent relationship with CIMO members and HMEI, through his monitoring of radiosonde performance, reporting on issues and preparing annual summaries for posting on the CIMO website. During the intersessional period Mr Oakley also developed a report to CBS on the status of the radiosonde types used in the TEMP code, December 2003.

2.3.4.2 ET-UGRN members Mr D. Dockendorff (Environment Canada) and Mr Roger Atkinson (the Australian Bureau of Meteorology) developed a Questionnaire on Techniques Used to Monitor Radiosonde Measurements. Once the responses are received the information will be analyzed and results provided to members. The results will be used during the next intersessional period for developing a plan for effective radiosonde data quality monitoring and performance measurement on a global basis.

2.3.4.3 Members of the ET-UGRN and ET-UASI participated in meetings with the Climate community to discuss radiosonde performance and concerns over perceived shortcomings in the current measurement network. The Climate community defined its requirements for upper-air data at the initial meeting and has presented them to CIMO and the manufacturers. The CIMO participants presented proposals for the use of HQ radiosondes as working references in future networks as well as a mechanism in identifying reference methods and reference instruments. The preliminary results of these meetings were discussed between the management group and Mr D. Goodrich, Director, GCOS, during a presentation on the subject. The future planning of GCOS also has embedded within its Implementation Plan to Support UNFCCC the need for establishment of a Global Climate Observing System Reference Upper-Air Network (GRUAN).

2.3.4.4 The ET coordinated with HMEI to solicit an agreement on BUFR code table and descriptors for International use. In this regard, Mr Oakley reviewed the current code table and identified those radiosonde descriptors that were obsolete. This was to allow new radiosonde designs to be added to the code table and this was completed shortly after the ET-UGRN initial session. It was expected that this code table would be used for the BUFR message and that later versions would be more detailed through the addition of metadata within the BUFR message. At the most recent joint meeting of the Coordination Team on Migration to Table Driven Code Forms and the Expert Team on Data Representation, Mr Fred Branski (as an invited expert to the ET-UGRN) reported that HMEI had agreed to the BUFR templates for TEMP code.

2.3.4.5 As for the migration strategy toward binary codes, the ET noted that CBS had the responsibility for developing a migration strategy. CBS has developed a Migration Implementation Plan (MIP) providing guidance to WMO Members. CIMO needs to be prepared to provide advice on MIP strategy.

2.3.4.6 Mr S. El-Fouly, Egyptian Meteorological Services, investigated measures for reducing the upper-air operational costs and conducted a survey to identify different options. 27 member states were involved in the survey. Despite the small sample return, Mr El-Fouly's findings confirmed the need for more assistance to developing countries.

2.3.5 Report of the OPAG UPPER-AIR (ET-UASI)

2.3.5.1 Mr J. Nash, UK Met Office, presented a summary of the WMO Intercomparison of High Quality Radiosonde Systems, Mauritius, 2-25 February 2005, with participation of a new generation of radiosondes being introduced into most of the global upper-air network. Five

new operational radiosonde systems from Europe, Japan and the US were intercompared. Two additional working references were flown within the Intercomparison to provide additional evidence on the accuracy of the operational radiosondes. The Intercomparison was intended to identify significant flaws in the new radiosonde designs, so these could be rectified before their use became widespread in the operational radiosonde networks. The MG noted with appreciation the work of Mr Beenay Pathack (Mauritius Meteorological Services) in managing local organization of the Intercomparison.

2.3.5.2 The Intercomparison results indicated that:

- Measurements of wind by the GPS radiosonde systems were of good availability and quality. Preparing the GPS radiosondes for flight is now much easier than in 2001.
- The GPS heights measured by the GPS radiosondes were so accurate that in most situations there is no longer need to use a pressure sensor on a GPS radiosonde.
- The Intercomparison in Mauritius demonstrated that errors identified in the WMO Intercomparison of GPS Radiosondes in Brazil have mostly been rectified.
- Temperature, pressure and relative humidity measurements by the six radiosondes agreed more closely than in any of the earlier WMO Radiosonde Intercomparisons.

2.3.5.3 Thus, all radiosondes in this Intercomparison were judged to merit the designation of high quality radiosonde and were of better quality than in the previous WMO Radiosonde Intercomparison in Brazil. While much progress has followed from major investments by the main manufacturers, the smaller manufacturers have also contributed with significant innovations generating a more competitive environment.

2.3.5.4 Some problems remained in most systems tested. When rectified, these will further improve radiosonde measurement quality including long-term stability of measurement quality. This should produce a stability in radiosonde measurements that has not been present in earlier generations of radiosondes.

2.3.5.5 Manufacturers need to consider from the report whether their radiosonde measurements need:

- Hydrophobic coatings on temperature sensors;
- Improved sensor exposure for daytime temperature measurements in the stratosphere;
- Prevention of chemical contamination of relative humidity sensors during storage;
- Procedures to minimize the effects of water contamination on humidity sensors after emerging from clouds;
- Procedures to minimize the effects of ice contamination on humidity sensors after emerging from clouds at all temperatures in the middle and upper troposphere;
- Improved procedures to eliminate low bias in daytime relative humidity caused by the humidity sensor observing at a higher temperature than the reported temperature (software correction or direct measurement of humidity sensor temperature?).

2.3.5.6 The working reference systems proved to be very useful in interpreting results from the Intercomparison, but were not developed to the stage that they could be used as stand alone references in the conditions experienced in Mauritius.

2.3.5.7 Recommendations on suitable radiosondes for future climate observing networks are presented in the full document. Most of the radiosondes tested in Mauritius could be brought up to a standard suitable for this work. Thus, it is suggested that the best traceable upper air measurement record might be obtained from measurements by two of the best operational radiosonde types at one observing site. For temperature measurements there is a large range of suitable sensors. For water vapour/relative humidity the range of sensor type is much more limited and further development of new sensors could be beneficial. An extended list of recommendations and conclusions can be found within the relevant sections of the report.

2.3.5.8 This Intercomparison was performed in Mauritius under the management of a small team supported by WMO. This team was responsible for conducting of the test and for training staff from Mauritius. The test demonstrated that the staff of the Mauritius Meteorological Services were of good quality and could be trained quickly in more advanced test procedures. This resulted in improved morale and knowledge within the Mauritius Services.

2.3.5.9 The deployment of a WMO management team to supervise the test was successful, but for future tests it should be recognized that the supervisory work involves a considerable amount of consultation with participants and involves more than purely managing test procedures. This consultation period extended for several months after completion of the test and was not limited to time spent in Mauritius.

2.3.5.10 The accuracy of radiosondes and the homogeneity of the world upper-air network have been of concern for more than 50 years. International field campaigns have been organized to improve comparability of upper-air data sets. Through these field tests and other related research activities manufacturers have benefited. Radiosonde technology has improved over the past several decades, but tracing the sensor improvements has been difficult without established criteria. The report presented by Mr B. Calpini, Mr C. Bower, and Mr P. Jeannet attempts to evaluate decades of comparisons with the goal of documenting the level of improvement in the quality of radiosondes. The task and objective for this report were developed at the March 2004 meeting of the ET-UASI-1. The authors first defined the criteria to be used in tracing the improvements of the past several decades. It was determined that the criteria should be based in documents already available. These criteria would be applied to future field CIMO UASI campaigns as well as national and regional Intercomparisons to insure the required continuous tracing. These criteria will also assist manufacturers and NMHSs in tracing the quality improvements of their radiosondes and radiosonde stations. The full report can be accessed on the CIMO/IMOP website: <http://www.wmo.int/web/www/IMOP/reports.html>.

2.3.5.11 Following the announcement of Vaisala Oyj to phase out the RS80/90 400 MHz radiosondes by the end of 2005, the ET members assisted the Secretariat in providing technical advice to Members related to the upgrade/replacement of their affected upper-air systems.

2.3.6 Report of the OPAG UPPER-AIR (ET-RSUAT&T)

2.3.6.1 Mr A. Ivanov, Russia, presented a report on the activities of the ET-RSUAT&T. The group prepared status report on how various countries were utilizing remote sensing systems in their current operations or were preparing to move these systems into operations. Mr S. de Haan, KNMI, the Netherlands prepared a Report on National and Regional procedures of GPS water vapour networks and agreed International procedures. This report summarized the on-going activities and procedures of 14 Member countries who provided information for this report. It will be published as the IOM Report No. 92.

2.3.6.2 Mr Engelbart (Germany) prepared IOM Report No. 79 "The Operational Aspects of wind profiler radars". Mr Kadygrov (Russian Federation) presented a Report on Operational Aspects of Different Ground-Based Remote Sensing Observing Techniques for Vertical Profiling of Temperature, Humidity, Wind and Clouds, which will be published as the IOM Report No. 89.

2.3.6.3 Mr P. Joe has prepared an outline for a guide on radar operational procedures that will be undertaken during the CIMO XIV Intersessional period.

2.3.7 Report of the OPAG-CAPACITY BUILDING (ET-TA&TM)

2.3.7.2 Mr E. Bazira presented a summary of activities undertaken by the ET-TA&TM. The ET's focused on the developing training materials and conducting training during the Intersessional period. The available training material will be published before the CIMO-XIV as the IMOP Report series. A list of activities are listed below:

- a. Developing Training Materials on Upper-Air Observations and conducting three training courses for operators (Gaborone, Botswana, 7-11 April 2003; Casablanca, Morocco, 1-5 December 2003, and Buenos Aires, Argentina, 8-12 May 2006). Lecture notes are available upon request from the Secretariat.
- b. Developing training materials on Operation and basic maintenance of Automated Weather Observing Systems and conducting a training course in Alanya, Turkey, 6-10 June 2005.
- c. Developing training materials on Metrology and calibration and conducting four Training workshops on Metrology, for the RICs (Trappes, France, 17-21 October 2005) for RA I English speaking countries (Cairo, Egypt, 22-26 April 2006), for RA VI South-Eastern Europe (Ljubljana, Slovenia, 10-11 April 2006), and for RA VI Central and Eastern Europe (Bratislava, Slovakia, 12-13 April 2006).
- d. Developing guidelines on basic Radar operations and maintenance and conducting training course in Alanya, Turkey, 12-16 September 2005.
- e. Developing innovative ways for reducing instrument costs.
- f. Engaging manufacturers of upper air systems, radars, and AWOS to participate in training courses.

2.3.8 Report of the OPAG-CAPACITY BUILDING (ET-RICs)

2.3.8.1 During the recent intersessional period the tasked ET members addressed issues related to determining the status of Regional Instrument Centres (RICs), particularly those located in developing countries. The ET began the process by issuing several questionnaires and from these efforts the members prepared a number of recommendations that led to the development of a plan for visiting and evaluating RICs. Elements of this plan called for the investment in an expert to prepare a report following visits and evaluations of RIC capabilities and performance.

2.3.8.2 The recognized expert from RIC Trappes, Mr J. Duvernoy, conducted evaluation visits of RICs in developing countries and prepared a questionnaire to RICs of developed countries. The ET agreed on the evaluation criteria for these visits. Findings of the expert, further developed by the ET, validated the need for updating the Terms of Reference (TOR) of the RICs and the need for qualification procedure and periodic evaluation and a well-defined set of evaluation criteria. The ET developed a proposed set of TORs to be submitted to CIMO-XIV for consideration and approval.

2.3.8.3 Members also explored options for establishing collaborative relationships between well-established RICs and newly established RICs. A number of these options were discussed and adopted within the newly proposed Terms of Reference for RICs.

2.3.9 Report of the OPAG-CAPACITY BUILDING (ET-CIMO-GUIDE)

2.3.9.1 The chairman of expert team presented a short report on the status of the 7th edition of the CIMO Guide. See [paragraph 3.4.5](#) for details.

2.4 Report on the Natural Disaster Prevention and Mitigation programme (DPM)

2.4.1 Following the recommendation of the CIMO Management Group, the Acting president of CIMO established within the CIMO-MG structure, the CIMO Coordinator for DPM as of 15 September 2005. Mr Rainer Dombrowsky (USA) agreed to serve as the Coordinator.

2.4.2 The following are the Terms of Reference of CIMO Coordinator for DPM:

- (a) To coordinate Commission activities, across its relevant Open Programme Area Groups, related to Natural Disaster Prevention and Mitigation (DPM) and advise Commission members on activities that will contribute fully to the DPM Programme including relevant enhanced operation of the World Weather Watch;
- (b) To provide the CIMO Management Group with appropriate information and recommendations on the Commission's DPM related activities.

2.4.3 Over the past nine months the CIMO Coordinator for DPM has attended informational briefings with Mrs M. Golnaraghi, Chief, DPM programme. Mr Dombrowsky has attended several pre-planning meetings to determine how CIMO could assist DPM in achieving its goals. During one of the pre-planning meetings the CIMO was afforded the opportunity to review two draft questionnaires that will to be distributed later this summer. These questionnaires were developed for technical commissions and Member NMHS response. Once all technical commission representatives have been identified and briefed, the C/DPM will convene a meeting of these representatives. The full group of working members will not meet until February 2007.

2.5 Report on the Global Earth Observing System of Systems (GEOSS)

2.5.1 Following the advise from the CIMO Management Group, the Acting president of CIMO has established within the CIMO-MG structure, the CIMO Coordinator for GEOSS as of 15 September 2006. Mr Rainer Dombrowsky (USA) agreed to serve as the Coordinator.

2.5.2 The following are Terms of Reference of the CIMO Coordinator for GEOSS:

- (a) To coordinate Commission activities, across its relevant Open Programme Area Groups, related to implementation aspects of the GEOSS 10-Year Implementation Plan and advise Commission members on activities that will contribute fully to the development and implementation of GEOSS including enhanced operation of the IMOP relevant to GEOSS;
- (b) To coordinate with other regional and technical commission GEOSS rapporteurs and liaise with the WMO Secretariat on relevant GEOSS activities;
- (c) To coordinate with GEO through its GEO Secretariat located with the WMO Secretariat on matters relevant to the Commission and GEO;
- (d) To provide the CIMO Management Group with appropriate information and recommendations on the Commission's GEOSS related activities.

2.5.3 Since making contact with GEO leadership the CIMO Coordinator has been added to the GEO information distribution list. In addition the CIMO Coordinator and the Secretariat were afforded the opportunity to provide input to the draft 2006 GEO Implementation planning document. Under the final GEO 2006 Task Document, activities under the CIMO IMOP are being supported and tasks documented under the plan. CIMO will be reporting quarterly on its 2006 activities and has been invited to provide technical review of the 2007-2009 Draft work plan, to provide comments to the Secretariat on new tasks, express any preliminary interest in leading or contributing to new tasks; and propose new tasks, and finally provide guidance and feedback on the convergence idea described in the forward of the work plan. Copies of the draft plan were provided to the MG for comment. MG comments

are due to the GEO focal point no later than July 14, 2006. The inserted pages will provide the latest status of Task number under the GEO 2006 Work Plan.

2.6 Report on the WMO Quality Management Framework (QMF)

2.6.1 The first meeting of the Inter-Commission Task Team on Quality Management Framework (ICTT-QMF) took place in Geneva, 25-27 April 2006. Mr Guido Halbig (Germany) represented CIMO at this meeting. The meeting summary provides information on the topics, which are likely to be addressed by EC-LVIII and which might require follow-up activities upon decisions of the Council. The Management Group will be informed at its session of the latest decisions.

2.6.2 A review of the CIMO Guide, Part III, "Quality Assurance and Management of Meteorological Observing Systems" and especially Chapter 3 "Quality Management" is presently under revision and the outline of this chapter was presented to the CIMO Expert Team on Regional Instrument Centres, Quality Management Systems and Commercial Instrument Initiatives meeting.

2.6.3 The EC had asked the technical commissions to carry out a review of their documentation as a priority activity within their regular work program in an attempt to identify areas of overlap and gaps. This review should rectify the issues of deficiencies, duplications, inconsistencies, and errors making those relevant WMO Technical Regulations, guides and manuals viable reference documents for use within a national Quality Management System. It should be noted that up to now, no concrete mechanism has been set up to carry out this review, but some initiatives have been taken by individual commissions, like for example, CIMO and CBS, which conducted a review of the inconsistencies between the CIMO Guide and the Manual and the Guide on the Global Observing Systems.

3. ISSUES RELATED TO PLANNING, COORDINATION AND MANAGEMENT OF COMMISSION ACTIVITIES

3.1 Review and discuss activities planned for CIMO-XIV

3.1.1 The MG discussed issues to be included on the agenda of CIMO-XIV and agreed on the preliminary agenda and its explanatory memorandum ([Annex 3.1.1](#)).

3.1.2 The MG discussed the preparation of documents for CIMO-XIV, agreed on the Documentation Plan for CIMO-XIV ([Annex 3.1.2](#)). It also agreed that the OPAG Co-chairpersons would present the documents at the Commission's session.

3.1.3 The MG prepared the Tentative Work Plan of the CIMO-XIV conjointly held with TECO-2006 ([Annex 3.1.3](#)).

3.1.4 The MG discussed the need for early call for nomination of experts to serve in various CIMO teams, agreed on the anticipated working areas of CIMO in 2007-2010 and on the Questionnaire for experts proposed for consideration as members of expert team and rapporteurs ([Annex 3.1.4](#)).

3.1.5 Referring to the reports of the OPAGs' Co-chairpersons (item 2.3), the MG prepared a list of the possible recommendations and resolution to be submitted to CIMO-XIV for consideration ([Annex 3.1.5](#)).

3.2 Review and Discussion Activities Planned for TECO 2006

3.2.1 The WMO is organizing, under the auspices of CIMO, the Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (TECO-2006). TECO-2006 will be held in Geneva from 4 to 6 December 2006 and will precede the fourteenth Session of CIMO (Geneva, 7-14 December 2006).

3.2.2 As the regular budget of WMO contains no provisions for interpretation services, TECO-2006 would most likely be conducted in English only. However, if sufficient funds can be mobilized, some limited interpretation services may be arranged.

3.2.3 The theme for TECO-2006 is “Innovations In Observing Systems and Practices to Meet The Evolving Needs Of Members”. The acting President of CIMO will present the keynote address.

3.2.4 The first announcement and a call for presentations for TECO-2006 were distributed on 15 March 2006 calling for papers. An International Programme Committee (IPC), chaired by the acting President of CIMO, did the selection of papers for oral presentations or poster displays. The authors of the papers and posters were informed accordingly (see CIMO/IMOP website for details: <http://www.wmo.int/web/www/CIMO/cimo-teco-meteorex.html>).

3.2.5 It was recognized that the number of submitted proposals for oral presentations significantly exceeded the time available for TECO, leading to a large number of submissions being allocated to poster sessions. Papers and posters will continue to be included on the IOM Report of the TECO-2006 and distributed to all Members on CD ROM. The MG agreed to discuss this issue at the next meeting to look for innovative solutions.

3.2.6 Noting that CIMO-XIV takes place immediately after TECO-2006, it has been agreed that the first two and a half days of TECO-2006 be devoted to lecture and poster presentations with the last half a day allocated to facilitate discussion on strategic items of the CIMO-XIV Agenda.

3.3 Future Work and Working Structure of CIMO

3.3.1 The MG evaluated the management aspects of the working structure established by CIMO-XIII. It took account of CIMO performance since 2002 and experience with current working structure, the recommendations of its Open Programme Area Groups (OPAGs) and Expert Teams (ETs), the conclusions of other WMO constituent bodies on issues related to CIMO, and the roles of other relevant intergovernmental and non-governmental organizations.

3.3.2 The MG agreed that the four years of experience proved that the existing structure had been responsive to the needs of Members and user community. In this regard, the MG recognized that the work programme and the deliverables of the Commission had increased significantly also due to the effective and flexible working structure based on the OPAGs and its ETs.

3.3.3 The MG agreed to propose to the Commission to re-establish the three Open Programme Area Groups on Surface Observation Technology (OPAG-Surface), on Upper-air Observation Technology (OPAG-Upper-Air) and on Capacity Building (OPAG-CB) and to re-establish the CIMO Management Group. It further agreed on the need to appoint within the CIMO-MG a CIMO Coordinator for GEOSS, a CIMO Coordinator for Natural Disaster Prevention and Mitigation (DPM) and a CIMO Coordinator for WMO Quality Management Framework (QMF). The MG also discuss the future work programme of the Commission and agreed on the terms of reference of the OPAGs, Expert Teams, Rapporteurs and Coordinators to be submitted to the CIMO-XIV for consideration.

3.3.4 The MG agreed on the document “Future Work and Working Structure of the Commission” to be submitted by the acting president of CIMO to the Fourteenth Session of the Commission ([Annex 3.3](#)).

3.4 Other Pertinent Issues

3.4.1 Status Report on Documents for CIMO XIV

3.4.1.1 The acting president requested co-chairpersons of the OPAGs to submit draft documents to the secretariat in the agreed time frame ([Annex 3.1.2](#)).

3.4.1.2 The MG requested the Secretariat to provide regular feedback to the president of CIMO and the Management group on the status of the preparation of documents to CIMO-XIV.

3.4.2 Status of IOM Reports

3.4.2.1 The MG discussed the status of preparation of the IOM Reports and agreed to publish the reports ([Annex 3.4.2.1](#)) on one CD ROM before the CIMO-XIV. The missing forewords will be prepared by the Secretariat for the acting president consideration. The IOM reports No. 85 and 90 need slight revision to be made by Mr Nash before mid September 2006.

3.4.3 Report on the status of Interoperable Upper-Air Systems

3.4.3.1 The HMEI submitted two reports on the Interoperable Upper-Air Systems prepared on behalf of the HMEI by Inter Met and Vaisala. As those reports do not agree in all aspects, it was decided that the vice-president of CIMO would submit a information document to CIMO on this subject to avoid any confusion passed to Members.

3.4.4 Discussions on Future Intercomparisons

3.4.4.1 The MG considered the proposals brought forward by two ETs on intercomparisons and decided to propose to CIMO-XIV for consideration the draft plan as attached in the [Annex 3.4.4.1](#).

3.4.5 Report on Changes to CIMO Guide Updating

3.4.5.1 Work on the update of the CIMO Guide started in January 2002 and finished in December 2005. 42 experts from 17 countries worked on the update of 32 chapters and on drafting two new chapters on Urban and Road Observations. All changes and proposals were approved at several levels; by the pre-editor (Mr Ralph Pannet), the technical editors (selected CIMO MG members) and, ultimately, the language service in the WMO Secretariat according to CIMO MG-1 guidance. The master version will be kept by the Secretariat. Preliminary release of the Seventh edition of the CIMO Guide was published on the CIMO/IMOP website in March 2006 and distributed to Permanent Representatives in May 2006 for comments. Received comments will be evaluated by technical editors and consolidated by the chairman of the ET on CIMO Guide. Only minor editorial changes are applied. Suggestions for additions and modifications should be submitted to the WMO Secretariat for evaluation before publication of the 8th edition. The WMO Secretariat will prepare the final version for consideration and approval by CIMO-XIV.

3.4.5.2 Technical editors identified the need for additional updates to the CIMO Guide. These were referred to the chairman of the ET on CIMO Guide for the next update period. The current process of updating the CIMO Guide is slow (The sixth edition was published in 1996). The user requirements are to implement changes in the Guide as they are needed, therefore the whole updating process needs to be reconsidered.

3.4.5.3 CIMO MG agreed that new procedures would be needed for future updates of the CIMO Guide. The new procedures should be based on the following assumptions:

- a. It is planned to have the 7th edition of the CIMO Guide available prior to the CIMO-XIV session, enabling CIMO to consolidate such revision. Any further revision/update will be initiated after receipt of proposal from a Member or from an OPAG and issued during the intercessional period.
- b. Responsibility for update/revision lies within the OPAG-CB and its rapporteur on the CIMO Guide.
- c. The Rapporteur on the CIMO Guide coordinates activities with the Secretariat, especially on substantial updates/revisions when a paid pre-editor is needed or when a task to update/revise a particular part of the Guide is needed and requires a paid pre-editor.
- d. Technical editors are selected by the relevant OPAG Co-chairpersons and approved by the President of CIMO.

- e. The Rapporteur on the CIMO Guide submits updates/revisions to the Secretariat in a form of tracked text, both hard copy and electronic, of the current version. The Secretariat will, in this way, assure the traceability to older versions.
- f. The CIMO President approves updates/revisions on behalf of the CIMO-MG of preliminary issues.
- g. The Permanent Representatives are requested to provide their comments to the preliminary issue. Their comments will be reviewed by technical editors and may result in some minor editorial improvements to be consolidated by the chairman of the Rapporteur on the CIMO Guide.
- h. The CIMO President approves updates/revisions for publication on behalf of the Commission.
- i. Updates of the relevant parts (pages) of the Guide will be published by the Secretariat as supplements. For a revision (new edition) a complete Guide will be reissued.
- j. A report is provided to regular sessions of CIMO as information.

3.4.5.4 The future working structure of the CIMO should, therefore, include a Rapporteur on the CIMO Guide with responsibility for future updates/revisions of the Guide.

3.5 The WMO Long-Term Plan Relevant to CIMO

3.5.1 At the recent Joint Meeting of Presidents of Technical Commissions and Presidents of Regional Associations, delegates were informed of developments relating to the implementation of the Sixth WMO Long-term Plan and about the process of preparing the Seventh WMO Strategic Plan 2008-2011.

3.5.2 The presentation by Mr Y. Adebayo, Strategic Planning Office, highlighted that it has been proposed that following the adoption of the WMO Strategic Plan, Technical Commissions (amongst others) should have strategic, implementation or operating plans or a combination of these in place to contribute to the overall WMO strategy. The MG agreed it would prepare a draft CIMO strategic plan for consideration by CIMO-XIV. The acting president, assisted by Mr Dombrowsky, will prepare a draft for comments by CIMO-MG members before mid September 2006.

3.5.3 It was noted that some changes may be required to align the plans of Technical Commissions with the WMO Strategic Plan to a common planning cycle. It was suggested that Technical Commissions and Regional Associations would have to prepare their plans at the beginning of the financial period, through their Presidents and Management/Advisory Committees. It was recommended that they identify their respective performance targets in support of WMO's overall Expected Results and Key Performance Targets identified in the Seventh Strategic Plan.

3.5.4 The Sixth Long-term Plan 2004-2011 contains nine key strategies. From an Instruments and Methods of Observations Programme (IMOP) perspective, two strategies link into CIMO role and objectives. They are:

“...Strategy 6: To observe, record and report on weather, water resources, climate and the related natural environment, to use these data for the preparation of operational forecast and warning services and related information, and to maintain and enhance systems to exchange these data, products and information.

Strategy 7: To enhance the capabilities of NHMSs to deliver services, and improve cooperation and collaboration between them...” (WMO No. 962)

3.5.5 “...the main long-term objectives of IMOP are:

- *To improve the quality and long-term stability of observations and measurements of meteorological and related environmental variables through*

the coordination and promotion of the use of efficient methods and technology to meet the requirements of operational and research applications;

- *To enhance the effective and economic use of observing technology/systems through training and technology transfer in developing countries...” (WMO No. 962)*

3.5.6 CIMO undertakes these objectives by developing and maintaining the publication of guidelines and standards and procedures for the quality management of observations and observing systems. These activities are also undertaken with respect to instrument operation, maintenance, and calibration practices.

3.5.7 CIMO supports capacity building activities, instrument comparisons, evaluation of Regional Instrument Centres, and standardization of measurements. CIMO also widely consults and collaborates with relevant international organizations and other WMO technical commissions.

3.5.8 The meeting may wish to adjust these CIMO key performance targets for the Seventh Long-term Plan.

4. OTHER BUSINESS

IPY 2007-2008

4.1 Dr E. Sarukhanian, Special Advisor to the Secretary-General on the International Polar Year (IPY), made a presentation to MG-3 on the status of IPY. IPY 2007-2008 is to be an intensive and internationally coordinated campaign of high quality research activities and observations in Polar Regions not otherwise undertaken. IPY 2007-2008 is intended to lay the foundation for major scientific advances in knowledge and understanding of the nature and behavior of the Polar Regions and their role in the functioning of the planet.

4.2 Dr Sarukhanian stated that in order to extend our knowledge on the variability of environmental processes within the Arctic and Antarctic and in order to develop more sophisticated techniques for weather forecasting, climate prediction, improvements in hydro-meteorological services it would be necessary to obtain long-term series of observational data using Global Observing Systems and IPY project observing facilities.

4.3 The MG provided advice relevant to instrument use during the IPY and stress the need to guarantee the traceability of measurements to SI, thus providing quality data sets from standard and hardened instruments developed to operate in harsh climates.

4.4 The CIMO Management Group was subsequently invited to provide guidance to the Inter-commission Task Group on its role in coordination and promotion of IPY activities within Technical Commissions and NMHS, in particular with respect to:

- Improvement of the observational networks;
- Rational use of existing and constructed modern equipment and instruments;
- Specific methods of observations in Polar Regions during the IPY and beyond;
- Evaluation of observational requirements contained in the full proposals for IPY and assess which can be met by existing or newly developed observing systems;
- Identify and recommend observing systems that could meet the IPY project requirements.

Collaboration with HMEI

4.5 Mr B. Sumner, HMEI representative, delivered a short presentation to the CIMO management Group on recent successful collaboration between CIMO and HMEI. He also reported on HMEI's desire to collaborate on future development of an instrument catalogue containing the CIMO-style Instrument sheets. Mr Sumner stated that HMEI is prepared to

host this catalogue on their website together with ongoing website maintenance, along with the HMEI Member Product Catalogue. HMEI is looking into the feasibility of a future integration of these catalogues. Following the presentation Dr Canterford indicated that it might be beneficial for the CIMO President or his designated representative to meet with the HMEI corporate board during their annual sessions to discuss such future collaboration. The possibility of CIMO participation in meeting with the HMEI corporate board will be addressed between the CIMO and the HMEI representatives.

5. CLOSURE OF THE SESSION

The Third CIMO Management Group session was closed at 16:05 h.

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EXPLANATORY MEMORANDUM RELATING TO THE PROVISIONAL AGENDA OF CIMO-XIV**1. OPENING OF THE SESSION**

The fourteenth session of the Commission for Instruments and Methods of Observation (CIMO-XIV) will be held in Geneva, Switzerland, from 7 to 14 December 2006. The opening ceremony will take place at 10.00 a.m. on Thursday, 7 December 2006.

2. ORGANIZATION OF THE SESSION**2.1 Consideration of the report on credentials**

In accordance with General Regulations 20 to 23 a list of representatives attending the session will be made available, which will be based on the credentials received by the Secretary-General before the session and on those handed to his representative at the session.

To enable the Secretariat to send in advance documentation relating to the session directly to the representatives of Members who will be attending, it is desirable that the Secretariat be notified of the names and addresses of the persons who will constitute the delegations as much in advance as possible. This information may accompany the credentials required under General Regulation 20 if these are sent sufficiently early.

2.2 Adoption of the agenda

In accordance with Regulation 190 the provisional agenda (distributed herewith) and any other items that may be submitted in accordance with sub-paragraph (7) of Regulation 190 will be put before the Commission for adoption. In accordance with Regulation 189, additional items for the agenda may be forwarded to the Secretariat before the session and should be accompanied by explanatory memoranda and documentation supporting the discussion of these items. By virtue of Regulation 192, the agenda may be amended at any time in the course of the session.

2.3 Establishment of committees

In accordance with Regulations 22 to 31, the session may wish to establish a Credentials Committee, a Nomination Committee, a Drafting Committee, a Coordination Committee and such other committees, as deemed necessary.

The Commission will decide when dealing with agenda item 2.1 whether or not a Credentials Committee should be established. In order to facilitate the election of officers, it is normal practice to establish a Nomination Committee. Experience at past sessions of technical commissions shows that the most expedient method is for each committee or sub-committee to establish its own arrangements for drafting its report to the Plenary. To ensure proper coordination of activities, the session will establish a Coordination Committee, according to Regulation 28.

The technical work of previous CIMO sessions has been carried out by two working committees, however with only one committee working at a time having simultaneous interpretation. The PINK reports of working committees were further considered by the plenary meetings. Experience obtained from recent sessions of WMO constituent bodies (RAs II, IV and VI, EC-LVII, CAS-XIV) has demonstrated the feasibility of conducting the entire session in plenary, however, it has been suggested by the President of CIMO to conduct CIMO-XIV in 3 sessions:

General Plenary Session will deal with agenda items 1 to 3, and 8 to 14;

Plenary Session A items: 4, 5;

Plenary Session B items: 6, 7.

Two co-chairpersons will be invited to assist the president.

2.4 Other organizational matters

Under this agenda item, the Plenary Session may wish to examine details relating to the organization of the session not dealt with under items 2.1 to 2.3 above, such as the working hours

of the meetings. The Commission may also wish to decide, in accordance with Regulation 111, whether summarized minutes of plenary meetings of the Commission are necessary.

3. REPORT BY THE PRESIDENT OF THE COMMISSION

This report will summarize the activities of the Commission since its last session (Bratislava, Slovakia, September/October 2002), actions taken by the President in support of the crosscutting activities and inter-commission actions that emerged during the intersessional period, proposals for future directions in the next intersessional period and changes to the Commission's terms of reference. The Commission normally has a general discussion of the President's report and refers any points requiring detailed study or subsequent action by the Commission under the appropriate agenda items.

4. INSTRUMENTS AND METHODS OF OBSERVATION FOR SURFACE MEASUREMENTS

4.1 Surface Technology and Measurement Techniques

The Commission is invited to review the Chairman's report of the Expert Team on Surface Technology and Measurement Techniques. The report will refer to the work plan of the team and deliverables achieved in areas of concern, such as standards for automated visual and subjective observations, the state-of-the-art of instruments and automated surface observing systems and urban and road meteorological measurements. The Commission is also invited to consider proposals and recommendations developed by the Expert Team, including proposal for future activities.

4.2 Surface-based Instrument Intercomparisons and Calibration Methods

The Commission is invited to review the Chairman's report of the Expert Team on Surface-Based Instrument Intercomparisons and Calibration Methods. The report will refer to the work plan of the team and deliverables achieved in conducting and evaluation of instrument intercomparisons planned by CIMO-XIII. Reference will be made to ongoing intercomparison activities. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

4.3 Meteorological Radiation and Atmospheric Composition Measurements

The Commission is invited to review the Chairman's report of the Expert Team on Meteorological Radiation and Atmospheric Composition Measurements. The report will refer to the work plan of the team and deliverables achieved in areas of concern, such as meteorological radiation measurements and international and regional pyrheliometer comparisons. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

5. INSTRUMENTS AND METHODS OF OBSERVATION FOR UPPER-AIR MEASUREMENTS AND REMOTE SENSING

5.1 Upgrading the Global Radiosonde Network

The Commission is invited to consider the Chairman's report of the Expert Team on Upgrading the Global Radiosonde Network. The report will refer to the work plan of the team and deliverables achieved in areas of concern, such as improvement of the global radiosonde network, performance measures to demonstrate continuous improvement in the quality of upper-air observations and support of radio frequency sharing policy for WRC. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

5.2 Upper-air System Intercomparisons

The Commission is invited to review the Chairman's report of the Expert Team on Upper-air System Intercomparisons. The report will refer to the work plan of the team and deliverables achieved in conducting and evaluation of instrument intercomparisons planned by CIMO-XIII. Reference will be made to ongoing intercomparison activities. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

5.3 Remote Sensing Upper-air Technology and Techniques

The Commission is invited to consider the Chairman's report of the Expert team on Remote Sensing Upper-Air Technology and Techniques. The report will refer to the work plan of the team and deliverables achieved in areas of concern, such as error characteristics of water vapor measurements, use of modern doppler radars and profilers in the upper-air network, operational use of lightning detection methods and integrated profiling systems. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

6. EDUCATION AND TRAINING, CAPACITY BUILDING

6.1 Training Activities and Training Materials

The Commission is invited to consider the Chairman's report of the Expert Team on Training Activities and Training Materials. The report will refer to working plan of the team and deliverables achieved in training and capacity building. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

6.2 Regional Instrument Centers, Quality Management Systems and Commercial Instruments Initiatives

The Commission is invited to consider the Chairman's report of the Expert Team on RICs, Quality Management Systems and Commercial Instruments Initiatives. The report will refer to the work plan of the team and deliverables achieved in areas of concern, such as strengthening the RICs and quality assurance and management of observing systems. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

6.3 Guide to Meteorological Instruments and Methods of Observation and Information Dissemination

The Commission is invited to consider the Chairman's report of Expert Team on CIMO Guide and Information Dissemination. The chairman will report on the status of the Guide to Meteorological Instruments and Methods of Observation. The Commission is also invited to consider proposals and recommendations developed by the team, including future activities.

7. ADDITIONAL MATTERS RELATED TO THE INSTRUMENTS AND METHODS OF OBSERVATION PROGRAMME

7.1 Global Earth Observing System of Systems (GEOSS)

A representative from the GEOSS program will present the case for GEOSS, providing information on the scope of GEOSS, briefly address the societal benefits and requirements, the architecture of a system of systems, the concept of data in the service of users, capacity building and finally outreach objectives. The Commission is invited to comment on the role of CIMO in GEOSS.

7.2 Natural Disaster Prevention and Mitigation

A representative from the Natural Disaster Prevention and Mitigation Program (NDPMP) will present an overview of this new program as established by the fourteenth World Meteorological Congress in its Resolution 29. The presentation will include the statement of program goals, societal benefits and expected deliverables. The Commission is invited to comment on the role of CIMO in the NDPMP

7.3 WMO Quality Management Framework

Recalling the decision of the Fourteenth WMO Congress (Resolution 27 (Cg-XIV)) on a Quality Management Framework, the Commission is invited to discuss its contribution related to WMO technical standards, quality management system(s) including quality control; and certification procedure(s).

7.4 WMO Information System

The Commission will be invited to discuss its participation in WMO Information System's development and implementation planning, with the emphasis of the role of CIMO programme centres, such as World Radiation Centre, Regional Radiation Centres and Regional Instrument Centres.

8. WMO STRATEGIC PLANNING RELEVANT TO THE COMMISSION

The Commission will be informed on the preparations of the WMO Strategic Plan (2008-20011) and will invited to provide guidance for the preparation of the CIMO Strategic Plan.

9. COLLABORATION WITH RELEVANT INTERNATIONAL ORGANIZATIONS

The Commission is invited to review the collaboration between the International Organization of Standardization (ISO), the International Committee for Weights and Measures (CIPM) and WMO in the area of standardization of meteorological instruments and methods of observation as well in the field of calibration standards and methods. The Commission is also invited to review its collaboration with the Association of the Hydro-Meteorological Equipment Industry Association.

10. FUTURE WORK AND WORKING STRUCTURE OF THE COMMISSION

The Commission will be invited to formulate a work programme for the Commission based on its considerations under the various agenda items and on the relevant objectives as given in the relevant parts of the WMO Long-term Plans. To carry out its work programme, it may also wish to establish Open Programme Area Groups, Expert Teams and appoint Rapporteurs to act until its next session. Regulations 32, 33, 34, 35 and 37 define the applicable procedures.

11. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION AND OF RELEVANT RESOLUTIONS OF THE EXECUTIVE COUNCIL

In accordance with Regulation 190, the Commission will be called upon to review its resolutions and recommendations adopted before this session, along with the relevant resolutions of the Executive Council, with a view to deciding which of them should be enforced or kept in force.

12. ELECTION OF OFFICERS

The Commission will be invited to elect a president and vice-president to hold office until the end of the next session of the Commission. Details regarding eligibility and procedures for elections are given in Regulations 11, 26, 79 to 82, 84, 86, 89, and 184, as well as the provisions of Resolution 37 (Cg-XI).

13. DATE AND PLACE OF THE FIFTEENTH SESSION

According to Regulations 186 and 187, the fifteenth session of the Commission is provisionally scheduled for late 2010. The Commission may wish to consider any invitations and suggestions that may be available at the time of the session regarding the date and venue of the next session. It would be advantageous if the Commission could have before it such proposals from Members. The Permanent Representatives of Members are asked to consult their governments on this point and are kindly requested to give appropriate instructions to their national delegates.

14. CLOSURE OF THE SESSION

The fourteenth session of the Commission for Instruments and Methods of Observation is scheduled to close on Thursday, 14 December 2006.

Preliminary Documentation Plan for CIMO-XIV

	Agenda item	Title of the document	No. of words	Draft by author of document		Final		D/WWW approval (date)	Submiss. to LSP (date)
				Respons.	Date	Respons.	Date		
1.	1	Opening Address of the Secretary General		SSO/OSY	15.09.06	SSO/OSY	1.10.06	10.10.06	
2.	2.	ORGANIZATION OF THE SESSION	0						
3.	2.2(1)	Provisional Agenda	300	SSO/OSY	15.04.06	SSO/OSY	15.05.02	15.07.06	31.07.06
4.	2.2(2)	Explanatory memorandum	2100	SSO/OSY	15.04.06	SSO/OSY	15.05.02	15.07.06	31.07.06
5.	3	REPORT BY THE PRESIDENT OF THE COMMISSION	3000	President	01.08.06	SSO/OSY	15.08.06	31.08.06	15.09.06
6.	4.	INSTRUMENTS AND METHODS OF OBSERVATION FOR SURFACE MEASUREMENTS	0						
7.	4.1	Surface Technology and Measurement Techniques	3000	J. v.d. Meulen	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
8.	4.2	Surface-Based Instrument Intercomparisons and Calibration Methods	3500	J. v.d. Meulen	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
9.	4.3	Meteorological Radiation and Atmospheric Composition Measurements	4000	K.-H. Klapheck	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
10.	5.	INSTRUMENTS AND METHODS OF OBSERVATION FOR UPPER-AIR MEASUREMENTS AND REMOTE SENSING	0						
11.	5.1	Upgrading the Global Radiosonde Network	3000	R. Dombrowsky	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
12.	5.2	Upper-Air Systems Intercomparisons	3000	J. Nash	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
13.	5.3	Remote Sensing Upper-Air Technology and Techniques	3000	A. Ivanov	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
14.	6.	EDUCATION AND TRAINING, CAPACITY BUILDING	0						
15.	6.1	Training Activities and Training Materials	2000	E. Bazira	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
16.	6.2	Regional Instrument Centers, Quality Management Systems and Commercial Instruments Initiatives	3700	H. Zhou	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
17.	6.3	Guide to Meteorological Instruments and Methods of Observation and Information Dissemination	2000	H. Zhou	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
18.	7.	ADDITIONAL MATTERS RELATED TO THE INSTRUMENTS AND METHODS OF OBSERVATION PROGRAMME	0						
19.	7.1	Global Earth Observing System of Systems	2000	D/SAT (Dombrowsky)	31.07.06	SSO/OSY	15.08.06	31.08.06	15.09.06

	Agenda item	Title of the document	No. of words	Draft by author of document		Final		D/WWW approval (date)	Submiss. to LSP (date)
				Respons.	Date	Respons.	Date		
20.	7.2	Natural Disaster Prevention and Mitigation	2000	C/DPM (Dombrowsky)	31.07.06	SSO/OSY	15.08.06	31.08.06	15.09.06
21.	7.3	WMO Quality Management Framework	2000	D/WWW	31.07.06	SSO/OSY	15.08.06	31.08.06	15.09.06
22.	7.4	WMO Information System	2000	D/WWW	31.07.06	SSO/OSY	15.08.06	31.08.06	15.09.06
23.	8.	WMO STRATEGIC PLANNING RELEVANT TO THE COMMISSION	3000	D/SPLA (President)	31.07.06	SSO/OSY	15.08.06	31.08.06	15.09.06
24.	9.	COLLABORATION WITH RELEVANT INTERNATIONAL ORGANIZATIONS	2000	SSO/OSY	31.07.06	SSO/OSY	15.08.06	31.08.06	15.09.06
25.	10.	FUTURE WORK AND WORKING STRUCTURE OF THE COMMISSION	4800	SSO/OSY	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
26.	11.	REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION AND OF RELEVANT RESOLUTIONS OF THE EXECUTIVE COUNCIL	1000	SSO/OSY	31.07.06	SSO/OSY	15.08.06	31.08.06	15.09.06
INF 1		Material arrangements	1200			C/CNF	30.06.06	15.07.06	31.07.06
INF 2		Tentative work plan	600	SSO/OSY	15.07.06	SSO/OSY	31.07.06	31.08.06	15.09.06
INF 3		Provisional list of participants	0	X	X	C/CNF	X	X	15.09.06
INF 4		Interoperable upper-air systems	1500	J. Nash	15.07.06	SSO/OSY	31.07.06	15.08.06	01.09.06
INF 5		Status of implementation and use of weather radars	1000	R. Dombrowsky	15.08.06	SSO/OSY	31.08.06	05.09.06	15.09.06
INF 6		Monitoring of upper-air wind	1000	T. Oakley	15.08.06	SSO/OSY	31.08.06	05.09.06	15.09.06
	Σ	Max. number of words allowed permitted: 56700¹	56700						

Note:

- A cover page for a document comprises cca 200 words
- One full page of text comprises cca 600 words
- A resolution/recommendation comprises cca 400 words

¹ See Memo of ASG from 5. 11. 2003

TENTATIVE WORKING PLAN
for
CIMO-XIV conjointly held with **TECO-2006**
(Geneva, Switzerland, 4 to 14 December 2006)

The plan is based on the assumption that the Commission will establish one Working Committee only.

All items will be discussed in plenary meetings	Monday 4 December		Tuesday 5 December		Wednesday 6 December		Thursday 7 December		Friday 8 December		Saturday 9 December		Sunday 10 Dec.	Monday 11 December		Tuesday 12 December		Wednesday 13 December		Thursday 14 December		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm		am	pm	am	pm	Am	pm	am	pm	
GENERAL PLENARY Items 1, 2, 3, 8, 9, 10, 11, 12, 13, 14	TECO - 2006						1 2 3 11					12 7.4	R E S E R V E D		8 9 10	WP	WP		PK	PK	PK	PK 11, 13, 14
PLENARY SESSION A Items 4, 5								4.1 4.2 4.3 5.1	5.2 5.3						WP	WP	WP					
PLENARY SESSION B Items 6, 7									6.1 6.2	6.3 7.1 7.2 7.3					WP	WP	WP					

Explanatory notes:

Figures indicate the agenda items
WP – consideration of working papers
PK – considerations of PINK reports

TECO-2006 - Technical Conference on Meteorological and Environmental Instruments and Methods of Observation.

Working hours:

Morning session 2 x 1h20: 09:30 – 12:30
Afternoon session 2 x 1h20: 14:30 – 17:30
Coffee breaks 0h20: 10:50 – 11:10; 15:50 – 16:10
Lunch break 2h00: 12:30 – 14:30

No sessions are planned on Sunday, 10 December

Dates and times of side meetings will be provided at the session

Annex 3.1.4

Nomination of Experts for CIMO Expert Teams and Rapporteurs

(Draft)

Our ref.: .../WWW/IMOP/CIMO-XIV GENEVA, 15 August 2006

Annexes: 2

Subject: Preparations for CIMO-XIV (Geneva, Switzerland, 7-14 December 2006) - Nomination of experts for CIMO expert teams or of rapporteurs.

Action required: To return to the WMO Secretariat before **1 October 2006** a completed form for each expert from your country proposes to be considered for nomination as member of expert teams or as a rapporteur at CIMO-XIV

Dear Sir/Madam,

The activities of the Commission for Instruments and Methods of Observation (CIMO) are organized under three Open Programme Area Groups (OPAGs) on: Surface Observation Technology (OPAG-Surface), Upper-air Observation Technology (OPAG-Upper-Air) and Capacity Building (OPAG-CB). Small, task-focused expert teams and rapporteurs under these OPAGs carry out work of the Commission.

In this context the current chairs of OPAGs will consider the work needing to be accomplished during the period 2007-2010 and will propose to CIMO-XIV the establishment of expert teams and rapporteurs. The areas of expertise corresponding to the anticipated work programme of the Commission are summarized in Annex I. The selection of individuals to serve as members of these teams is greatly facilitated if information is provided on national experts available to work in the various fields of the Commission's activities.

The Secretariat is circulating this material to Members before CIMO-XIV to permit them sufficient time to propose experts as potential members of a CIMO expert teams or as a rapporteur. Members proposing candidates should understand the commitment of these individuals to spend the time required completing the tasks assigned to him/her. Since most teams will consist of a small number of members there is no guarantee that each nominated expert will actually be selected as a team member. However, your nominated expert(s) will become a registered member(s) of the corresponding OPAG(s) and as such will be included in the exchange of information and consultations by correspondence conducted within an OPAG.

To: Permanent Representatives of Members of WMO who are members of CIMO
To: CIMO MG members

- 2 -

It would be appreciated if you could nominate your candidates by returning the attached form (see Annex II), one for each expert, to the Secretariat not later than **1 October 2006**.

Finally, I should like to refer to Regulation 6, which authorizes you, as the normal channel of communication between the Organization and your country, to propose as rapporteurs or members of expert teams also individuals who work in other governmental and non-governmental establishments in your country, subject, of course, to their personal agreement and that of their employer.

Yours faithfully,

(Hong Yan)
for the Secretary-General

WORLD METEOROLOGICAL ORGANIZATION

..../WWW/IMOP/CIMO-XIV, ANNEX I

Anticipated Working Areas of CIMO in 2007-2010²

**1. Open Programme Area Group on Surface Observation Technology
(OPAG-Surface)**

- 1.1 Surface Technology and Measurement Techniques
- 1.2 Surface-based Instrument Intercomparisons and Calibration Methods
- 1.3 Meteorological Radiation and Atmospheric Composition Measurements

**2. Open Programme Area Group on Upper-air Observation Technology
(OPAG-Upper-Air)**

- 2.1 Upgrading the Global Radiosonde Network
- 2.2 Upper-air System Intercomparisons
- 2.3 Remote Sensing Upper-air Technology and Techniques

**3. Open Programme Area Group on Capacity Building
(OPAG-CB)**

- 3.1 Regional Instrument Centers, Quality Management Systems and Commercial Instruments Initiatives
- 3.2 Training Activities and Training Materials
- 3.3 CIMO Guide
- 3.4 Regional Implementation Activities

4. Crosscutting Issues

- 4.1 WMO Quality Management Framework
- 4.2 Global Earth Observing System of Systems
- 4.3 Disaster Prevention and Mitigation
- 4.4 Climate Observations

² See Appendix for preliminary Terms of Reference of expected CIMO Expert Teams

WORLD METEOROLOGICAL ORGANIZATION

.../WWW/CIMO-XIV, ANNEX II

**EXPERT PROPOSED FOR CONSIDERATION AS MEMBER OF AN EXPERT TEAM
OR AS RAPPORTEUR AT CIMO-XIV**

Country/Organization:

1. Surname: Dr, Mr, Ms ¹⁾

2. First name:

3. Mailing address:

.....

4. Telephone: Fax:

E-mail:

5. Employing institution:

6. Position held:

7. Major area of expertise³⁾:

8. Please tick cells corresponding to the list numbers of the areas proposed in Annex I

1. OPAG-SURFACE			2. OPAG- UPPER-AIR			3. OPAG-CAPACITY-BUILDING				4. CROSSCUTTING ISSUES			
1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4

9. Level of knowledge of working language used for expert team meetings (tick as appropriate):

English:
excellent good fair

Date: Signature:
 (Permanent Representative)

Completed form should be sent **before 1 October 2006** to:

The Secretary-General
 World Meteorological Organization
 P. O Box 2300
 CH-1211 Geneva 2
 Switzerland
 Fax: (+41 22) 730 8021

¹⁾ Delete the non-appropriate.
³⁾ Include half a page of your Curriculum Vitae

LIST OF RECOMMENDATIONS BY TOPIC AS APPROVED BY MG-3

1. Siting of sensors in harsh climate regions.
To be drafted by: J. van der Meulen
2. Classification of weather reporting stations.
To be drafted by: M. Leroy / J. van der Meulen
3. New standard laboratory calibration procedures for Rainfall Intensity instruments.
To be drafted by: M. Leroy/J. van der Meulen
4. Selection of identified gauges as “reference” for Rainfall Intensity.
To be drafted by: M. Leroy / J. van der Meulen
5. Terms of Reference (TOR) of the World, Regional and National radiation centres.
To be drafted by: K. Behrens/K-H. Klapheck
6. Development of UV Calibration Centres.
To be drafted by: K. Behrens / K-H. Klapheck
7. Creation of a primary WMO Reference Centre for Optical Depth.
To be drafted by: K. Behrens / K-H. Klapheck
8. WRC Infrared Radiometry Section (WRC-IRS).
To be drafted by: K. Behrens / K-H. Klapheck
9. Interoperable Systems for Upper-Air.
To be drafted by: J. Nash
10. Geo-potential height using GPS Sondes rather than pressure sensors.
To be drafted by: J. Nash
11. Use of “Reference” Radiosondes for Climate.
To be drafted by: J. Nash
12. Strengthening Regional Instrument Centres.
To be drafted by: H. Zhou
13. Approval of the Seventh Edition of the CIMO Guide.
To be drafted by: CIMO Secretariat

10. FUTURE WORK AND WORKING STRUCTURE OF THE COMMISSION (agenda item 10 of the CIMO-XIV)

10.1 The Commission recalled the decision of the CIMO-XIII to establish a working structure that would enable it to meet the needs of Members most effectively during the intersessional periods. The initial four years period was evaluated by the CIMO Management Group at its second (CIMO-MG-2) and third (CIMO-MG-3) sessions, Bucharest, Romania, 2-3 May 2005, and Geneva, Switzerland, 3-7 July 2006, respectively. In doing so, it took account of CIMO performance since 2002 and experience with current working structure, the recommendations of its Open Programme Area Groups (OPAGs) and Expert Teams (ETs), the conclusions of other WMO constituent bodies on issues related to CIMO, and the roles of other relevant intergovernmental and non-governmental organizations.

10.2 Four years of experience proved the existing structure is responsive to Member and user community needs. In this regard, the Commission recognized that the work programme and deliverables of the Commission have increased significantly due to the effective and flexible working structure based on the OPAGs and its ETs.

10.3 The Commission thanked all the chairpersons and members of the expert teams for their contribution to the CIMO OPAGs. The Commission expressed its sincere gratitude to those who were no longer able to continue serving in those positions for their important contribution to the work of the Commission over many years.

10.4 The Commission agreed on its work programme, based on the relevant sections of the Sixth WMO Long-term Plan and relevant decisions of the Executive Council, and taking into account detailed discussions under the various agenda items. The Commission decided to re-establish the three Open Programme Area Groups on Surface Observation Technology (OPAG-Surface), on Upper-air Observation Technology (OPAG-Upper-Air) and on Capacity Building (OPAG-CB) and adopted Resolution 10/1 (CIMO-XIV).

10.5 The Commission decided to re-establish the CIMO Management Group and adopted Resolution 10/2 (CIMO-XIV). It further decided to appoint within the CIMO-MG a CIMO Coordinator for GEOSS to coordinate Commission activities across its relevant Open Programme Area Groups and related to the GEOSS 10-Year Implementation Plan (see agenda item 7.1), a CIMO Coordinator for Natural Disaster Prevention and Mitigation (DPM) (see agenda item 7.2) and a CIMO Coordinator for WMO Quality Management Framework (QMF) (see agenda item 7.3).

10.6 With a view to making the necessary arrangements for efficiently carrying out the various tasks under the agreed work programme and the corresponding activities, the Commission agreed to establish teams as well as rapporteurs within each of the OPAGs and to allocate them tasks as given in the **Annex** to this paragraph.

10.7 The Chairs of the ETs and Rapporteurs who were designated by the Commission are given in the **Annex** to this paragraph.

10.8 The Commission requested the CIMO Management Group to establish the membership of the ETs of each OPAG. It invited the chairpersons of the OPAGs and respective teams, in co-operation with the Secretariat, to develop targets for deliverables based on the tasks agreed by CIMO-XIV, and adequate working mechanisms to ensure all experts could actively participate and contribute to the work programme and assist the respective teams.

Draft Resolution

Res. 10/1 (CIMO-XIV) – CIMO OPEN PROGRAMME AREA GROUPS (OPAGs)

THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION,

RECALLING: Resolution 1 (CIMO-XIII) – Working Structure of the Commission for Instruments and Methods of Observation,

NOTING: Resolution 9 (EC-LVI) – Global Earth Observing System of Systems,

DECIDES:

- (1) To re-establish
 - (a) The OPAG on Surface Observation Technology (OPAG-Surface)
 - (b) The OPAG on Upper-air Observation Technology (OPAG-Upper-Air)
 - (c) The OPAG on Capacity Building (OPAG-CB)
- (2) To update the terms of reference for each OPAG as given in the **Annex** to this resolution
- (3) To select, in accordance with General Regulation 32, the co-chairpersons for each of the Open Programme Area Group as follows:
 - (a) OPAG on Surface Observation Technology:
 - Co-chairperson..... (.....country.....);
 - Co-chairperson:..... (.....country.....);
 - (b) OPAG on Upper-air Observation Technology:
 - Co-chairperson:..... (.....country.....);
 - Co-chairperson:..... (.....country.....);
 - (c) OPAG on Capacity Building:
 - Co-chairperson:.....(.....country.....);
 - Co-chairperson:(.....country.....).

DECIDES FURTHER:

- (1) To establish a CIMO Coordinator for the Global Earth Observation System of Systems (GEOSS) with the following Terms of Reference:
 - (a) To coordinate Commission activities, across its relevant Open Programme Area Groups, related to implementation aspects of the GEOSS 10-Year Implementation Plan and advise Commission members on activities that will contribute fully to the development and implementation of GEOSS including enhanced operation of the IMOP relevant to GEOSS;
 - (b) To coordinate with other regional and technical commission GEOSS rapporteurs and liaise with the WMO Secretariat on relevant GEOSS activities;
 - (c) To coordinate with GEO through its GEO Secretariat located with the WMO Secretariat on matters relevant to the Commission and GEO;
 - (d) To provide the CIMO Management Group with appropriate information and recommendations on the Commission's GEOSS related activities;
- (2) To select to serve as the Coordinator for the GEOSS;
- (3) To establish a CIMO Coordinator for Natural Disaster Prevention and Mitigation (DPM) with the following Terms of Reference:

- (a) To coordinate Commission activities, across its relevant Open Programme Area Groups, related to Natural Disaster Prevention and Mitigation (DPM) and advise Commission members on activities that will contribute fully to the DPM Programme including relevant enhanced operation of the World Weather Watch;
 - (b) To provide the CIMO Management Group with appropriate information and recommendations on the Commission's DPM related activities.
- (4) To select to serve as the CIMO Coordinator for DPM.
- (5) To establish a CIMO Coordinator for WMO Quality Management Framework (QMF) with the following Terms of Reference:
- (a) To coordinate Commission activities, across its relevant Open Programme Area Groups, related to QM and QA and advise Commission members on activities that will contribute fully to the WMO Quality Management Framework (QMF);
 - (b) To provide the CIMO Management Group with appropriate information and recommendations on the Commission's QM and QA related activities.
 - (c) Monitor progress of the development of the WMO QMF across the technical commissions and represent CIMO in the Intercommission Task Team (ICTT) on QMF;
 - (d) Review and assess the experience of NMHSs with QM and QA;
 - (e) Coordinate the consolidation and updating of CIMO technical standards and recommended practices;
 - (f) Collaborate with ISO and BIPM in the standardization activities of the Commission;
 - (g) Provide support to the harmonization of the terminology of the technical guidance documents (technical regulations, manuals, guides, guidelines, technical documents) of WMO and of possible joint ISO-WMO technical standards as relates instruments and methods of observation.
- (6) To select to serve as the CIMO Coordinator for WMO QMF.

REQUEST:

- (1) The co-chairpersons of the OPAGs to act upon matters referred to the OPAG by the president of CIMO;
- (2) The co-chairpersons of the OPAGs and the CIMO Coordinators:
 - (a) To prepare an activity report at the end of every calendar year for distribution to CIMO members;
 - (b) To submit a report to the Commission not later than four months prior to its session.

ANNEX TO RESOLUTION 10/1 (CIMO-XIV)
TERMS OF REFERENCE OF OPAGs

A. GENERAL TERMS OF REFERENCE OF THE SURFACE AND UPPER-AIR TECHNOLOGY OPAGs

1. Carry out the activities of the OPAG and ensure contributions are relevant and timely.
2. Review and publish results and recommendations relating to the state-of-the-art of operational instrumentation, calibrations and methods of observation as well as their use in different application areas and report on their performance.
3. Work closely with other technical commissions and Regional Associations through representatives and regional rapporteurs, in order to coordinate the ongoing standardization of observation technologies.
4. Respond to requirements of users of all WMO Programmes and to recommend appropriate action of the Commission, including provision of guidance material.
5. Support other WMO Programmes and bodies through the provision of specifications for instruments and observing systems in order to meet requirements for the measurement of meteorological, related geophysical and environmental variables, taking into account both experience and new developments.
6. Prepare technical specification for selection of instrument and observing systems for use in WMO and national procurement procedures.
7. In coordination with relevant ETs, strengthen further the Regional Radiation Centres (RRCs), regularly evaluate their functions and capabilities and suggest corrective measures.
8. Facilitate effective collaboration on crosscutting issues, such as WMO Integrated Global Observing System (WIGOS), WMO Quality Management Framework (QMF), Natural Disaster Prevention and Mitigation Programme (DPM) and the Global Earth Observing System of Systems (GEOSS). Cooperate with CIMO Coordinators for WMO QMF, DPM and GEOSS.
9. Propose, coordinate implementation, review and evaluate global and regional intercomparisons of instruments and methods of observation in collaboration with relevant manufacturers and the Hydro-Meteorological Equipment Industry Association (HMEI).
10. Review, develop and update guidance material related to instruments and methods of observation.
11. Provide guidance concerning instrument types, characteristics, accuracies, performance, as well as, effective and economical use of instruments and methods of observation.
12. Promote studies on methods of observation, including test and calibration methods.
13. Encourage research and development of new approaches in the field of instruments and methods of meteorological observation and related geophysical, and environmental variables
14. Promote the economical production and use of instruments and methods of observation with particular attention to the needs of developing countries

15. Facilitate actions towards worldwide traceability of measurements to the International System of Units (SI).
16. Monitor and cooperate with the relevant work of international and regional bodies, such as the International Organization for Standardization (ISO) and the International Committee for Weights and Measures (CIPM/BIPM), European Cooperation in the field of Scientific and Technical Research (COST), The Network of European Meteorological Services (EUMETNET), and appropriate other international organization, report on such work and advise on action as necessary. Advise the CIMO Coordinator on WMO QMF on these matters.

B. GENERAL TERMS OF REFERENCE OF THE OPAG ON CAPACITY BUILDING

1. Work closely with other technical commissions and regional associations on issues related to capacity building, such as their involvement in instrument comparison, workshops, seminars and activities of the regional instrument centers.
2. Maintain close liaison with the regional Rapporteurs on Instrument Development, Related Training and Capacity Building, review their reports and recommend action to deal with indicated deficiencies.
3. Develop proposals on resource mobilization including how to engage manufacturers in building capacity.
4. Review the needs for building national capacities related to IMOP with the view to making developing countries more self-reliant.
5. Review, develop and update guidance and training material related to instruments and methods of observation and liaise with the RMTCs on these matters.
6. Prepare plans for urgently needed training workshops and, in collaboration with the OPAGs on SURFACE and UPPER-AIR prepare training material and assist the Secretariat in their organization.
7. Ensure guidance information on modern technology is available to Members.
8. Promote the use of calibration standards by RICs and Members and facilitate associated technology transfer activities.
9. Develop further basic procedures for quality management of observations, instrument maintenance, calibration and operation (based on the sixth edition of the WMO Guide to Meteorological Instruments and Methods of Observation, WMO-No. 8 (CIMO Guide).
10. Provide guidance to Members on strategies for the procurement process of instrumentation and related management.
11. In coordination with relevant ETs, strengthen further the Regional Instruments Centres (RICs), regularly evaluate their functions and capabilities and suggest corrective measures.
12. Promote, through the RICs and RRCs, worldwide traceability of measurements to the International System of Units (SI).

Draft resolution

Res. 10/2 (CIMO-XIV) – CIMO MANAGEMENT GROUP

THE COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION,

RECALLING:

- (1) Resolution 1 (CIMO-XIII) – Working Structure of the Commission for Instruments and Methods of Observation,
- (2) Resolution 2 (CIMO-XIII) – Commission for Instruments and Methods of Observation Management group,

RECOGNIZING:

- (1) That the effectiveness of the Commission depends to a large extent on the effective management of its activities and effective communication between sessions,
- (2) That a management group will be required to ensure the integration of programme areas, to evaluate the working progress achieved, to coordinate strategic planning, and decide on necessary adjustments to the working structure of the Commission during the intersessional period,

DECIDES:

- (1) To re-establish a CIMO Management Group (CIMO-MG) with the following terms of reference:
 - (a) To advise the president on all matters related to the work of the Commission;
 - (b) To assist president in planning and coordinating the work of the Commission its Open Groups and Expert Teams;
 - (c) To plan, coordinate and actively manage the work of the Commission, its Open Groups and Expert Teams, including evaluating the progress achieved in the work programmes and advising on the new priority activities;
 - (d) To monitor the implementation of the IMOP Programme in relation to the WMO Strategic Plans and advise the president on appropriate actions;
 - (e) To ensure the overall integration of the programme areas and coordinate IMOP strategic planning issues;
 - (f) To advise the president on matters related to cooperation with other technical commissions, regional associations and other relevant international organizations and governmental or non-governmental bodies;
 - (g) To mobilize resources to enable the work of the Commission to be achieved;
 - (h) To keep under review the internal structure and working methods of the Commission and make necessary adjustments to the working structure during the intersessional period;
 - (i) To keep under review the terms of reference of the Open Programme Area Groups and Expert Teams and make necessary adjustments;
 - (j) To advise the president on all team leader designations necessary between sessions of the Commission;
 - (k) To coordinate the activities of the Commission with respect to GEOSS;
 - (l) To coordinate the activities of the Commission with respect to NDPM;
 - (m) To coordinate the activities of the Commission with respect to WMO QMF;
 - (n) To provide CIMO input to the evolving role and enhancement of WMO with respect to CIMO;
 - (o) OPAG chairs will refrain from acting as ET chairs.

- (2) That the composition of the CIMO Management Group shall be as follows:
- (a) The president of CIMO (chairperson);
 - (b) The vice-president of CIMO;
 - (c) The co-chairpersons of the OPAGs;
 - (d) The CIMO Coordinator for Natural Disaster Prevention and Mitigation (NDPM);
 - (e) The CIMO Coordinator for Global Earth Observing System of Systems (GEOSS);
 - (f) The CIMO Coordinator for WMO Quality Management Framework (QMF).

Annex to paragraph 10.6 of the general summary

TERMS OF REFERENCE OF OPAG TEAMS AND RAPPORTEURS

A. OPAG-SURFACE

A.1 Expert Team on Surface Technology and Measurement Techniques (ET-ST&MT)

1. Continue monitoring progress in development of new surface observation technologies and measurement techniques;
2. Determine if additional siting standards are needed for Synoptical meteorology, Climate, Marine, Agrometeorology, Hydrology as well as Urban and Roadway sensor locations or whether some AWS require different siting requirements. As needed provide recommendations for the development of additional siting standards to be implemented in the CIMO Guide;
3. In cooperation with the HMEI, monitor, report and recommend standard observing methods for the automatic measurement of present weather, clouds and weather phenomena. Advise on optimizing manual and automated methods for reporting present weather, clouds and weather phenomena;
4. Evaluate the performance of AWOSs in tropics and consult manufacturers on relevant findings to propose improved designs. Advise Members on use of AWOS in extreme climatological conditions;
5. Monitor and review the available algorithms used in AWSs and advise on their possible standardization;
6. Support to NDPM in identifying how surface-based technologies can support monitoring of natural hazards;
7. In view of the increased impact of extreme weather events, encourage the instrument manufacturers and others to develop more robust instruments with greater resilience to extreme weather condition and with increased measuring range;
8. Taking into account the environmental concerns of Members using mercury-based instruments investigate alternative solutions and advise Members;
9. Develop guidelines and procedures for the transition from manual to automatic surface observing stations.

A.2 Expert Team on Surface-based Instrument intercomparisons and Calibration Methods (ET- SBII&CM)

1. CIMO ET-SBII&CM will act as the International Organizing Committee for Surface-based Instrument Intercomparison (IOC-SBII);
2. The ET will prepare proposals for instrument Intercomparisons according to the CIMO Plan and available funds;
3. The ET will prepare an implementation plan for each approved Intercomparison proposal;
4. Coordinate activities related to the organization and conduct of WMO Surface-Based Instrument Intercomparisons according to the CIMO Plan. This will involve liaison with HMEI. The emphasis should be put on the ongoing intercomparisons, namely: the WMO Field Intercomparison of rainfall intensity gauges (Vigna di Valle, Italy, 2007-08) and the WMO Combined Intercomparison of Thermometer Screens/Shields in conjunction with humidity measurements (Ghardaïa, Algeria, 2007-08);
5. To take responsibility for overseeing the evaluation of the intercomparison test results;
6. To peer review the test results before publication;

7. To take responsibility for producing targeted documents and recommendations for the user communities who have requested the test, including representatives of HMEI, operational network managers, GCOS and GEOSS managers;
8. Providing technical and scientific advice on surface-based measurements to Members, as requested through the WMO secretariat.

A.3 Expert Team on Meteorological Radiation and Atmospheric Composition Measurements (ET-MR&ACM)

1. Initiate and coordinate pre, and post-comparison activities of IPC-XI, 2010, WRC, Switzerland;
2. Initiate and coordinate pre, and post-comparison activities of RPCs, 2006-2010, either in conjunction with IPC-XI or at RPCs concerned;
3. Coordinate the dissemination of World Radiometric Reference (WRR) factors to regional and national radiation standards;
4. Liaise with the World Climate Research Programme on matters related to Baseline Surface Radiation Network and inform Members of developments;
5. Liaise with the CAS SAG Ozone on the operational practice associated with total ozone measurements;
6. Liaise with the CAS SAG UV on operational practice associated with UV measurements;
7. Liaise with the CAS SAG Aerosol on operational practice associated with AOD measurements;
8. Update the relevant parts of the CIMO Guide;
9. Collaborate with the WRC in the further development of the World Infrared Standard Group (WISG) of radiometers;
10. Coordinate the dissemination of pyrgeometer calibration coefficients;
11. Provide technical/scientific guidance to the WRC Davos;
12. Examine the transfer of WISG to network measurements of infrared irradiance;
13. Initiate activities so that radiation measurements in all national radiation networks are of a high quality;
14. Determine the status of the traceability of radiation measurements to SI:

B. OPAG-UPPER AIR

B.1 Expert Team on Upgrading the Global Radiosonde Network (ET-UGRN)

1. Continue to monitor performance of radiosondes in GOS and liaise with Members and HMEI on performance issues. Reports will be posted annually to the CIMO website;
2. Investigate options for reducing cost of upper-air observations;
3. Continue monitoring the status of radio frequencies for ground based observing systems by developing and maintaining a strategy for protecting currently allocated frequencies;
4. Complete a review of best practices used in the quality management of upper-air networks from which a methodology for affecting better performance can be derived;
5. Using identified best practices prepare proposals for updating all affected portions of the CIMO Guide;
6. Liaise with the CBS Surface-based Subsystem Implementation working group through

their Regional rapporteurs in identifying ways to address the large gaps (related to instrument performance) in upper-air reporting which persist in some regions;

7. Conduct a review of recent AMDAR papers comparing AMDAR to other Upper-air monitoring networks and preparing a report, with recommendations on the benefits of integrating AMDAR into any future Integrated Upper-air Observation System;
8. Promote further the studies on interoperable Upper-air systems, evaluate performance of the existing ones and advise Members;
9. In collaboration with the HMEI, address the issue related to the operational safety of hydrogen generators used at the upper-air stations and assist R-TA&TM in developing relevant training modules;
10. Collaborate with GCOS, CCI and CBS in establishing the GCOS Reference Upper- Air Network (GRUN) and provide guidance on the operational practices used at GRUN.

B.2 Expert Team on Upper-air System Intercomparisons (ET-UASI)

1. CIMO ET-UASI will act as the International Organizing Committee for Upper-air Systems Intercomparison (IOC-UASI) according to the CIMO Guide;
2. Prepare proposals for instrument Intercomparisons based on the CIMO Plan and allocated funds;
3. Prepare an implementation plan for each approved Intercomparison proposal;
4. Coordinate activities related to the organization and conduct of WMO Intercomparisons of in-situ and remote sensing upper-air systems according to the CIMO Plan. This will involve liaison with HMEI. It will also recommend the number of experts supported by WMO necessary to implement the test;
5. To take responsibility for overseeing the evaluation of the intercomparison test results;
6. To peer review the test results before publication;
7. To take responsibility for producing targeted documents and recommendations for the user communities who have requested the test, including representatives of HMEI, operational network managers, GCOS and GEOSS managers;
8. Providing technical and scientific advice on upper air measurements to Members, as requested through the WMO secretariat;
9. Submit meta-data records and intercomparisons for radiosonde observations to International Data Centers;
10. Continue liaison with HMEI in improving consistency of the humidity measurements between day and night.

B.3 Expert Team on Remote Sensing Upper-air Technology and Techniques (ET-RSUT&T)

1. Identify procedures for improving the quality and availability of remotely sensed upper wind measurements;
2. Develop an implementation plan, based on the reports prepared, addressing the suitability of modern radars and wind profilers;
3. Review operational standards for wind profiler radars and prepare guidance materials for Members' use;
4. Review available applications provided by meteorological radars and provide advise to Members;
5. Review practices for calibration of meteorological radars and provide advise to Members;

6. Conduct accuracy evaluation of methods for precipitation measurements from meteorological radars;
7. Review recent results on calibration requirements for satellite remote sensing in line with the development in the WMO Integrated GOS;
8. Monitor and report on lightning remote-sensing performance methods;
9. Report on changes and improvements in national and regional lightning detection networks and projects;
10. Monitor the progress of integrating various ground-based monitoring systems and techniques which when integrated provide improved detection results;
11. Monitor the status of frequency allocation for surfaced-based observing systems such as wind profilers;
12. Promote WMO and regional Intercomparisons of remote and in-situ Upper-air sounding systems;
13. Prepare proposals and recommendations on converging systems for greater collaborative and interoperability;
14. Investigate possibilities of developing standards and protocols for exchange of data from the networks of ground-based GPS receivers.

C. OPAG-CAPACITY BUILDING

C.1 Expert Team on RICs (ET-RICs)

1. Develop criteria for regular evaluation and establish metrics for assessing RIC performance;
2. Define standard calibration instruments for use by RICs for calibration of meteorological and related environmental instruments;
3. Engage manufacturers in developing RIC technical procedures for instrument calibration and instrument maintenance;
4. Collaborate with the RICs in defining RIC functional capabilities;
5. Strengthen the Quality Assurance of the RICs/RRCs as a crosscutting issue involving the regional and technical cooperation activities as well as GCOS;
6. Identify the need for regional workshops on metrology;
7. Develop a methodology for conducting Intercomparisons between legacy and next generation calibration instruments as well as between different calibration tools;
8. In collaboration with RAs, establish qualification and evaluation procedures, including procedures for rectification of problems when necessary;
9. Improve procedures for quality management of observations, instrument maintenance, calibration and operational practices;
10. Monitor the capabilities and functions of the RICs through yearly reports and 5-year evaluation of the RIC and inform relevant Members and presidents of RAs;
11. Promote further the partnership between RICs of developing and developed countries and to encourage Members to use the system of internship in RICs in the various WMO Regions;
12. Review and provide guidance to develop the IMOP capacities of developing countries, in particular the development and fabrication of instruments;
13. Coordinate with the CMA preparation of future versions of the World Meteorological Instrument Catalogue. Investigate the possibility for collaboration with the Hydro-Meteorological Equipment Industry Association.

C.2 Rapporteur on Training Activities and Training Materials (R-TA&TM)

1. In collaboration with the CIMO OPAGs, RICs, RRCs and the HMEI, coordinate CIMO training and capacity building activities;
2. Assist in implementation of CIMO training and capacity building events, such as training workshops on Upper-Air Measurements (depending on the available resources concentrate on Regions where training has not yet been held), technical conferences (TECO-2008 and TECO-2010) and exhibition of meteorological instruments (METEOREX-2008 and METEOREX-2010);
3. Cooperate with the RMTCs/RICs/RRCs in promoting training courses related to instruments and methods of observations, with a special emphasis on automated observing systems, radar systems, instrument maintenance and calibration;
4. Prepare training material used in the above training for publication under IOM Report series;
5. In collaboration with other ETs, develop computer-aided learning strategy and explore a possibility to establish a Virtual Training Laboratory in one of the RICs and RRCs;
6. In collaboration with the HMEI, develop further the training components within the CIMO/IMOP Web Portal;
7. Cooperate with manufacturers, RICs and RRCs in promoting attachments / on-the-job training of instrument specialist from developing countries;
8. In collaboration with the HMEI, develop training material for technicians on the maintenance and use of various individual instruments and Automated Weather Observing Systems (AWOSs), meteorological radars and on algorithms for use by AWOS.

C.3 Rapporteur on CIMO Guide (R-CIMO-Guide)

1. In collaboration with the CIMO OPAGs, the ETs, the HMEI and the Secretariat, coordinate activities aimed at regular maintaining and updating the CIMO Guide, namely:
 - a. Collect proposals from user community for updates and revisions;
 - b. Identify areas to be updated, revised or completely rewritten and advise the CIMO-MG;
 - c. Identify experts for updating/revision of the relevant parts of the Guide and advise the CIMO-MG;
 - d. Coordinate the work of experts on the CIMO Guide;
 - e. Arrange for approval of the updated/revised parts of the Guide according to a procedure approved by the CIMO-MG;
 - f. Provide updates/revisions in a form of track changes for consideration by the CIMO-MG and approval by the president of CIMO or a CIMO session;
 - g. Provide regular reports to the CIMO-MG and Secretariat;
2. In collaboration with the CIMO OPAGs, the ETs, the HMEI develop further the CIMO/IMOP Web Portal on Development, Maintenance and Operation of Instruments, Observing Methods and Automatic Weather Stations. Provide regular information to members;

C.4 Rapporteur on Regional Implementation Activities (R-RIA)

1. Liaise with the Regions (regional rapporteurs, regional centers) in assisting CIMO expert teams in implementing of instrument and methods of observations in the Regions;

C.5 Rapporteur on Climate Observation (R-CO)

1. Collaborate with CCI in monitoring emerging requirements for climatological observation;
2. In collaboration with relevant CIMO and CCI OPAGs, conduct studies and draft relevant proposals for observing practices for climate monitoring;
3. In coordination with the Rapporteur on CIMO Guide include updated/new practices in the revised versions of the Guide;
4. Provide guidance on the selection and use of instruments in harsh climatological conditions.

Annex to paragraph 10.7 of the general summary

DESIGNATION OF CHAIRPERSONS AND RAPPORTEURS OF THE OPAG TEAMS

A. OPAG-SURFACE

- A.1 Expert Team on Surface Technology and Measurement Techniques (ET-ST&MT)
..... (.....country.....)
- A.2 Expert Team on Surface-based Instrument intercomparisons and Calibration Methods (ET-SBII&CM)
..... (.....country.....)
- A.3 Expert Team on Meteorological Radiation and Atmospheric Composition Measurements (ET-MR&ACM)
..... (.....country.....)

B. OPAG-UPPER AIR

- B.1 Expert Team on Upgrading the Global Radiosonde Network (ET-UGRN)
..... (.....country.....)
- B.2 Expert Team on Upper-air System Intercomparisons (ET-UASI)
..... (.....country.....)
- B.3 Expert Team on Remote Sensing Upper-air Technology and Techniques (ET-RSUT&T)
..... (.....country.....)

C. OPAG-CAPACITY BUILDING

- C.1 Expert Team on RICs, Quality Management Systems and Commercial Instruments Initiatives (ET-RICs)
..... (.....country.....)
- C.2 Rapporteur on Training Activities and Training Materials (R-TA&TM)
..... (.....country.....)
- C.3 Rapporteur on CIMO Guide (R-CIMO-Guide)
..... (.....country.....)
- C.4 Rapporteur on Regional Implementation Activities (R-RIA)
..... (.....country.....)
- C.5 Rapporteur on Climate Observation (R-CO)
..... (.....country.....)

STATUS OF IOM REPORTS

No	IOM No. TD No.	IOM Report	Author	Status
		CIMO-XII related		
1.	IOM 76 TD 1153	GPS Radiosonde Comparison – Brazil, 20 May – 10 June 2001, Executive summary	R. Silveira et al.	Published in 2003 on CD and website
2.	IOM 77 TD 1159	Road Managers and Meteorologists on Road Meteorological Observations	J. Terprstra & T. Ladent	Published in 2003 on CD and website
3.	IOM 78 TD 1160	Evaluation of the AWS Algorithm Questionnaire	M. Gifford	Published in 2003 on CD and website
4.	IOM 79 TD 1196	Operational Aspects of Wind Profiler Radars	J. Dibbern et al.	Published in 2005 on CD and website
5.	IOM 80 TD 1197	WMO Catalogue of Radiosondes and Upper-Air Wind Systems in Use by Members in 2002, and Compatibility of Radiosonde Geopotential Measurements for period from 1998 to 2001	J. Elms	Published in 2004 on CD and website
6.	IOM 85 TD 1305	The WMO Relative Humidity Sensor Intercomparison, Phase I (Russian Federation, 1995-1997) and Phase II (Wallops Islands, USA, 8-26 September 1995) - Final Report	A. Balagurov F. Schmidlin et al.	Planned in 2006 on CD Report ready. Needed: - ET/IOC chair approval, - Foreword
7.	IOM 90 TD 1314	GPS Radiosonde Comparison – Brazil, 20 May – 10 June 2001, Final report	J. Nash, R. Silveira	Planned in 2006 on CD Report ready. Needed: - ET/IOC chair approval, - Foreword
8.		7 th Edition of Instrument Development Inquiry	J. v.d. Meulen	In preparation
		CIMO-XIII related		
9.	IOM 81 TD 1250	Initial guidance to obtain representative meteorological observations at urban sites	T. Oke	Published in 2004 on website Planned in 2006 on CD
10.	IOM 82 TD 1265	Papers and Posters - TECO-2005		Published in 2005 on CD and website
11.	IOM 83, TD 1303	The WMO Intercomparison of Radiosonde Systems, Mauritius, 2-25 February 2005; Final report	J. Nash et al.	Published in 2006 on website Planned in 2006 on CD Needed: Foreword
12.	IOM 84 TD 1304	The WMO Laboratory Intercomparison of Rainfall Intensity Gauges (France, Netherlands, Italy, Sep 2004 - June 2005) - Final Report	L. Lanza et al.	Published in 2006 on website Planned in 2006 on CD Needed: Foreword
13.	IOM 86 TD 1306	Training Material on Metrology and Calibration	Jérôme Duvernoy Aurélié Dubois	Planned in 2006 on CD Report ready. Needed: Foreword

No	IOM No. TD No.	IOM Report	Author	Status
14.	IOM 87 TD 1307	Training Material on Automated Weather Observing Systems	E. Büyükbaş et al.	Planned in 2006 on CD Report ready. Needed: Foreword
15.	IOM 88 TD 1308	Training Material on Weather Radar Systems	E. Büyükbaş et al.	Planned in 2006 on CD Report ready. Needed: Foreword
16.	IOM 89 TD 1309	Operational Aspects of Different Ground-Based Remote Sensing Observing Techniques for Vertical Profiling of Temperature, Wind, Humidity and Cloud Structure	E. N. Kadygrov	Planned in 2006 on CD Report ready. Needed: Foreword
17.	IOM 91 TD 1320	The International Pyrheliometer Comparison, Davos, Switzerland, 26 September to 14 October 2005, - Final Report	W. Finsterle	Planned in 2006 on CD Report ready.
18.	IOM 92	The National/Regional Operational Procedures of GPS Water Vapour Networks and Agreed International Procedures	S. de Haan et all	Planned in 2006 on CD Report ready. Needed: Foreword
19.		8 th Edition of Instrument Development Inquiry	K. Hegg	In preparation
20.		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

**Provisional Plan of WMO International Comparisons and Evaluations
of Meteorological Instruments (2007-2010)**

No.	Title of proposed WMO Intercomparisons	Year(s)	Site(s)
1.	Regional Pyrheliometer Comparison (RA II)	Jan. 2007	Tsukuba, Japan
2.	WMO Combined Intercomparison of Thermometer Screens/Shield in conjunction with Humidity Measuring Instruments	2007-2008	Ghardaïa, Algeria
3.	WMO Field Intercomparison of Rainfall Intensity Gauges	2007-2008	Vigna di Valle, Italy
4.	Regional Pyrheliometer Comparison (RA V)	2008	Melbourne, Australia
5.	WMO Intercomparison of remotes sensing instruments and in-situ radiosonde systems	2008	Lindenberg, Germany
6.	WMO Regional Intercomparisons of Radiosonde Systems	2008-2009	China / India / Russia
8.	Eleventh International Pyrheliometer Comparison (IPC-XI) in conjunction with Regional Pyrheliometer Comparisons	Sep – Oct. 2010	Davos, Switzerland
9.	WMO Intercomparison of thermometer screen/shields	2010-2011	In Arctic region
10.	WMO Intercomparison of stream flow gauges		

NOTE:

1. Planning of the intercomparisons, their objectives and the operational aspects will be agreed by the relevant expert team/International organizing committee.
2. Implementation of the proposed intercomparisons depends on the available resources and support from the instrument manufacturers.