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COMMISSION FOR INSTRUMENTS AND METHODS  
OF OBSERVATION

ITEM: 2.2

CIMO MANAGEMENT GROUP  
First session

ENGLISH only

Los Angeles/Ca., USA, 13 - 15 February 2003

### **Terms of Reference of Expert Teams**

*(Submitted by Secretariat)*

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### **Summary and purpose of document**

This document contains a draft structure of CIMO OPAGs and draft proposal of TOR of CIMO Expert Teams.

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### **Action proposed**

The meeting is invited to examine the draft proposals and decide on the structure of CIMO OPAGs and on the TOR of CIMO Expert Teams for the next period.

## **Background Information**

1. The thirteenth session of the Commission for Instruments and Methods of Observation requested the CIMO Management Group (CIMO-MG) to "Keep under review the internal structure of the Commission and make adjustment, as necessary" and to "Keep under review the Terms of Reference (TOR) of Expert Teams and make necessary adjustment".
2. Based on revised tasks to be undertaken of the CIMO OPAGs (Doc.2.1) a draft structure of CIMO OPAGs and corresponding TOR of CIMO Expert teams are presented in Appendix B and Appendix C, respectively.

**STRUCTURE OF CIMO OPAGs  
(Draft Proposal)**

**A. OPAG-SURFACE**

- A.1 Expert Team on Surface Technology and Measurement Techniques
  - A.1.1 Rapporteur on Urban Meteorological Measurements
  - A.1.2 Rapporteur on Road Meteorological Measurements
- A.2 Expert Team on Surface-based Instrument intercomparisons and Calibration Methods
- A.3 Expert Team on Meteorological Radiation Measurements

**B. OPAG-UPPER AIR**

- B.1 Expert Team on Upgrading the Global Radiosonde Network
  - B.1.1 Rapporteur on Integrated Observing Systems
  - B.1.2 Rapporteur on Radiofrequency Issues
- B.2 Expert Team on Upper-air System Intercomparisons
- B.3 Expert Team on Remote Upper-air Technology and Techniques
  - B.3.1 Rapporteur on Lightning Detection Systems

**C. OPAG-CAPACITY BUILDING**

- C.1 Expert Team on Training Activities
- C.2 Expert Team on Quality Management Systems Procedures
- C.3 Expert Team on Development Guidance and Training Materials
- C.4 Expert Team on Developing IMOP Capacities and on Technical Assistance

**TERMS OF REFERENCE OF CIMO EXPERT TEAMS  
(Draft Proposal)**

**A. OPAG-SURFACE**

**A.1 Expert Team on Surface Technology and Measurement Techniques**

1. Report and recommend methods for automated visual and subjective observations, with emphasis on:
  - (a) Systems measuring present weather (including clouds, icing, state of the ground, lightning and thunderstorms);
  - (b) Standardization of algorithms for AWSs, (CIMO-XIII/4.1.7).
2. Agree on standards for automation of manual, visual and subjective observations, (CIMO-XIII/11.7).
3. Provide guidance on the state-of-the-art of instruments and Automated Surface Observing Systems (ASOS), in particular on:
  - (a) Development and implementation of instruments and ASOS;
  - (b) Instrument and ASOS implementation and siting in varying environmental conditions;
4. Review the table on *Operational Accuracy Requirements and Typical Instrument Performance*, (CIMO-XIII/4.1.12);
5. Update relevant WMO practices/guidelines and develop guidance on metadata requirements.

**A.1.1 Rapporteur on Urban Meteorological Measurements**

6. Report on progress of urban meteorological measurements;
7. Monitor the emerging requirements for measurements and develop pertinent technical recommendations for standards and practices to be included in the CIMO Guide.

**A.1.2 Rapporteur on Road Meteorological Measurements**

8. Report on progress of road meteorological measurements;
9. Monitor the emerging requirements for measurements;
10. Explore further difference in perception of WMO standards for synoptic stations at road meteorological observing stations, especially in the light of the requirements of modern road monitoring and traffic management systems, (CIMO-XIII/4.6.3);
11. Develop pertinent technical recommendations for standards and practices to be included in the CIMO Guide.

## **A.2 Expert Team on Surface-based Instrument Intercomparisons and Calibration Methods**

1. Organize and evaluate WMO instrument intercomparisons:
  - (a) IPC-X, 2005, WRC, Switzerland, (CIMO-XIII/8.9);
  - (b) RPCs, 2004-2006, either in conjunction with IPC-X or at RPCs concerned, (CIMO-XIII/8.9);
  - (c) Rainfall Intensity gauges, 2003, in various climatic regions, (CIMO-XIII/8.9);
  - (d) Thermometer screens/shields, 2003-2005, in various climatic regions, (CIMO-XIII/8.9);
  - (e) Hygrometers, 2003-2005, in various climatic regions, (CIMO-XIII/8.9);
  - (f) Intercomparison of spectral radiometers (used for aerosol optical depth determination) from the Regional Radiation Centres (in tandem with IPC-X), (CIMO-XIII/5.5.6);
  - (g) A combined CAS/GAW and CIMO intercomparison UV measurement instruments (spectrometers, broadband instruments and filter instruments), (CIMO-XIII/5.6.7).
2. Prepare proposals for other instrument intercomparisons:
3. Review advances in calibration methods.

## **A.3 Expert Team on Meteorological Radiation Measurements**

1. Liaise with the World Climate Research Programme on matters related to Baseline Surface Radiation Network and inform Members of developments;
2. Review the operational practice associated with total ozone measurements. Prepare recommendations for a standard automated ozone observational site;
3. Review the operational practice associated with UV and, aerosol optical depth measurements;
4. Monitor the efforts of the CAS Scientific Steering Committee on UV Measurements and use the relevant reports, when available, as the basis for updating Chapter 7, "Measurement of radiation", of Part I of the *CIMO Guide*, (CIMO-XIII/5.6.2);
5. Develop further the establishment of a World Standard Group of absolute long-wave radiometers, (CIMO-XIII/4.5.8);
6. Coordinate the dissemination of World Radiometric Reference (WRR) factors to regional and national radiation standards, (CIMO-XIII/4.5.9);
7. Initiate activities so that high quality solar radiation measurements may be widely guaranteed in all national radiation networks, and support on request the National Radiation Centers (NRCs) through training courses and in the establishment of networks in areas with a low density of radiation stations, such as in RA I,

(CIMO-XIII/4.5.9);

8. Provide technical/scientific guidance in the establishment and continuing quality assurance of WIRCC Davos, (CIMO-XIII/4.5.14).

## **B. OPAG-UPPER AIR**

### **B.1 Expert Team on Upgrading the Global Radiosonde Network**

1. Improve the global radiosonde network through:
  - (a) Development of techniques and annual reports on the performance of radiosonde types in the GOS;
  - (b) Soliciting agreement on BUFR code table and descriptors for international use (1-2 years);
  - (c) Dealing with the technical issues involved in modernizing and improving the accuracy of the radiosonde component of the upper-air network, e.g., working reference for future radiosonde comparisons, (CIMO-XIII/5.1.14).
2. Review the existing data processing algorithms for radiosondes and recommend on a global standard.
3. Review the error characteristics of water vapour measurements and explore compatibility between the different types of measurement:
4. Prepare guidance material on developing GPS water vapour networks;
5. Monitor and assist in the introduction of humidity measurements in AMDAR systems.

#### **B.1.1 Rapporteur on Integrated Observing Systems**

6. Promote, facilitate and assist with developments in integrated observing systems;
7. Monitor the progress of projects set up to integrate different ground-based observing techniques together to provide improved sensing of vertical profiles of temperature, humidity and cloud structure, (CIMO-XIII/5.1.29).

#### **B.1.2 Rapporteur on Radiofrequency Issues**

8. Continue radiofrequency allocation studies for ground based observing systems;
9. Improve coordination of radiosonde operating frequencies between neighboring countries;
10. Assist in coordination and protection of radiofrequencies for ground-based observing systems, (CIMO-XIII/5.1.12).

## **B.2 Expert Team on Upper-air System Intercomparisons**

1. Organize and evaluate WMO radiosonde intercomparisons to detect error characteristics of various types of aerological measurement systems, establish links to previous designs and systematic differences between new radiosonde designs (over 4 years).
2. Organize and evaluate WMO intercomparison of remote and in situ U/A sounding systems, 2003-2005, (CIMO-XIII/8.9).
3. Review procedures of publication of results of WMO Radiosonde Intercomparisons, (CIMO-XIII/5.1.8).

## **B.3 Expert Team on Remote Upper-air Technology and Techniques**

1. Investigate and recommend deployment aspect of modern conventional and Doppler radars as well as wind profilers:
2. Recommend ways to improve quality and availability of remotely sensed upper wind measurements;
3. Study the operational performance of weather radars in developing countries and publish the findings in an IOM Report series;
4. Prepare and publish guidance material on operational aspects of wind profiler radars in Europe, United States and Japan in the IOM Report series, (CIMO-XIII/5.7.7).
5. Monitor and report on new development of other measurement techniques, in particular lidar, microwave radiometer, sodar, RASS, etc.
6. Monitor and report on calibration of satellite remote sensing instrumentation.

### **B.3.1 Rapporteur on Lightning Detection Systems**

7. Monitor and report on progress in lightning detection;
8. Monitor and report on national and regional lightning detection projects and networks;
9. Propose evaluation methods for operational lightning detection systems;
10. Review the progress in the compatibility of lightning detection remote-sensing and conventional in-situ observations.

## **C. OPAG-CAPACITY BUILDING**

### **C.1 Expert Team on Training Activities**

1. Work with Regional Associations to ensure effective RIC activities and to develop proposals for strengthening the role of the RICs:

- (a) Strengthen further the services of RICs, particularly those located in developing countries, such as calibration practices and reporting, (CIMO-XIII/4.1.10);
  - (b) Improve the guidance for RICs, review their terms of reference and develop an appropriate procedure to assist in evaluation of RICs, (CIMO-XIII/7.17, CIMO-XIII/11.6, CIMO-XIII/11.7);
  - (c) Conduct periodic visits to RICs, by CIMO's representative or regional authority, to provide needed training/briefings and validating the compliance to the stated terms of reference. Evaluate existing RICs, (CIMO-XIII/7.17, CIMO-XIII/11.6, CIMO-XIII/11.7);
  - (d) Explore the possibility of strengthening cooperation among RICs by the establishment of a mutual relationship between RICs in the developed and the developing countries, (CIMO-XIII/7.18).
2. Organize technical conferences and training in collaboration with other technical commissions and the HMEI as appropriate, and seek innovative ways and means to reduce the cost of TECOs, for example as regards the organization of the interpretation services, the working mechanisms of the programme committee, the production of the conference proceedings, etc., (CIMO-XIII/7.27);
  3. Promote the use of cost-effective distance-learning media and computer-assisted instruction with respect to training in instruments and methods of observation. Monitor and reported on it, (CIMO-XIII/7.4);
  4. Cooperate with manufacturers with a view to engaging them in providing training on their systems, especially in developing countries, (CIMO-XIII/7.23);

## **C.2 Expert Team on Quality Management Systems Procedures**

1. Provide advice on Quality Management Systems procedures for instruments and methods of observations (based on the CIMO Guide) and implement links with relevant international organization active on this area;
2. Develop performance measures to demonstrate continuous improvement in the quality of observations, (CIMO-XIII/11.6);
3. Contribute to the review and update of WMO Technical Regulations, Guides and other material related to Quality Management and standardization of observations, (CIMO-XIII/11.6);
4. Develop basic procedures for quality management of observations, instrument maintenance, calibration and operational practices, (CIMO-XIII/11.7).

## **C.3 Expert Team on Development Guidance and Training Materials**

1. Maintain and update the CIMO Guide (WMO-No 8) and assist in the production of an electronic version of the CIMO Guide, (CIMO-XIII/10.5);
2. Advise on changes required for the Instrument Catalogue;
3. Review available and develop new training materials (CIMO-XIII/5.1.13).



4. Develop a Web-portal for access to all types of information on instruments, such as methods of observation, AWSs, algorithms, intercomparisons, TECO papers, etc., (CIMO-XIII/4.1.7).

#### **C.4 Expert team on Developing IMOP Capacities and on Technical Assistance**

1. Review and provide guidance to develop the IMOP capacities of developing countries, in particular the development and fabrication of instruments;
2. Encourage development and operation of low-cost, good quality meteorological and hydrological observing systems, (CIMO-XIII/7.25);
3. Develop proposals for joint procurement mechanisms for consumables to assist developing countries in achieving a reduction in the cost of instrument operation;
4. Evaluate technical reports concerning instrument requirements in developing countries generated by namely experts, and provide technical advice on related project implementation.