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COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION

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Review of the tasks to be undertaken of the OPAGs

(Submitted by Secretariat)

Summary and purpose of document

This document contains a review of the tasks to be undertaken of the OPAGs based on the outcomes of CIMO-XIII.

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Action proposed

The meeting is invited to examine the reviewed tasks and decide on the tasks to be undertaken of the OPAGs in the next period.

Background Information

1. The thirteenth session of the Commission for Instruments and Methods of Observation requested the OPAG co-chairpersons to ensure that specific work areas, described in respective parts of the final report of the CIMO-XIII, were adequately addressed.

2. Tasks described in the final report of CIMO-XIII and not included in the list of tasks of PINK 13 "Future working structure of the Commission, establishment of groups and nomination of experts", were added to the Proposed tasks to be undertaken of the OPAGs (Appendix B). This would facilitate discussion on the OPAG structure and on the establishment of CIMO Expert Teams (Doc.2.2).

PROPOSED TASKS TO BE UNDERTAKEN OF THE OPAGs
(Updated upon the outcomes of CIMO-XIII Session)

A. OPAG-SURFACE

1. Report and recommend methods for automated visual and subjective observations

(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);

(c) Standards for automation of manual, visual and subjective observations, (CIMO-XIII/11.7).

2. Provide guidance on the state-of-the-art of Instruments and Automated Surface Observing Systems (ASOS)

(a) Review and report on development of instruments and ASOS;

(b) Provide guidance to members and other users on the implementation of ASOS;

(c) Provide guidance on implementation in varying environmental conditions;

(d) Provide improved guidance for siting of meteorological instrumentation and update WMO regulations;

(e) Provide guidance on metadata requirements.

3. Prepare proposals for instrument intercomparisons

(a) Newly developed instruments;

(b) Currently operational instruments;

(c) Organize and evaluate WMO Instrument intercomparisons:
- i. IPC-X, 2005, WRC, Switzerland, (CIMO-XIII/8.9);
- ii. RPCs, 2004-2006, either in conjunction with IPC-X or at RPCs concerned, (CIMO-XIII/8.9);
- iii. Rainfall Intensity gauges, 2003, in various climatic regions, (CIMO-XIII/8.9);
- iv. Thermometer screens/shields, 2003-2005, in various climatic regions, (CIMO-XIII/8.9);
- v. Hygrometers, 2003-2005, in various climatic regions, (CIMO-XIII/8.9);
- vi. 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);
- vii. A combined CAS/GAW and CIMO intercomparison UV measurement instruments (spectrometers, broadband instruments and filter instruments), (CIMO-XIII/5.6.7).

4. Review advances in calibration methods

5. Facilitate further activities related to meteorological radiation measurements

(a) Liaise with the World Climate Research Programme on matters related to Baseline Surface Radiation Network and inform Members of developments;

(b) Review the operational practice associated with total ozone measurements. Prepare recommendations for for a standard automated ozone observational site;

(c) Review operational practice associated with UV and, aerosol optical depth measurements;

(d) 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);

(e) Develop further the establishment of a World Standard Group of absolute long-wave radiometers, (CIMO-XIII/4.5.8);

(f) Coordinate the dissemination of World Radiometric Reference (WRR) factors to regional and national radiation standards, (CIMO-XIII/4.5.9);

(g) 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);

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

6. Report on progress of urban and road meteorological measurements

(a) Monitor the emerging requirements for measurements and develop pertinent technical recommendations for standards and practices to be included in the CIMO Guide;

(b) 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).

B. OPAG-UPPER AIR

1. Improve the global radiosonde network

(a) 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);

(b) Develop techniques and report annually on the performance of

radiosonde types in the GOS;

(c) Solicit agreement on BUFR code table and descriptors for international use (1-2 years);

(d) Deal 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);

(e) Review procedures of publication of results of WMO Radiosonde Comparisons, (CIMO-XIII/5.1.8);

(f) Organize and evaluate WMO intercomparison of remote and in situ U/A sounding systems, 2003-2005, (CIMO-XIII/8.9).

2. Investigate error characteristics of water vapour measurements and explore compatibility between the different types of measurement

(a) Prepare guidance material on developing GPS water vapour networks;

(b) Monitor and assist in the introduction of humidity measurements in AMDAR Systems.

3. Investigate the suitability of modern conventional and Doppler radars for deployment in NMHSs

(a) Improve quality and availability of remotely sensed upper wind measurements;

(b) Report on the suitability of modern radars and wind profilers for deployment in NMHS;

(c) Report and advise manufacturers on the operational performance of weather radars in developing countries;

(d) Prepare and publish a 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).

4. Monitor and report on new development of other upper-air measurement techniques

(a) The techniques are expected to include lidar, microwave radiometer, sodar, RASS, etc.

5. Monitor and report on calibration of satellite remote sensing instrumentation

6. Investigate the standardization of data processing algorithms for radiosondes

7. Report on progress of lightning detection

(a) Monitor and report on national and regional lightning detection projects and networks;

(b) Propose evaluation methods for operational lightning detection systems;

(c) Review the progress in the compatibility of lightning detection remote-sensing and conventional in-situ observations.

8. Promote, facilitate and assist with developments in integrated observing systems

(a) 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).

9. Continue radiofrequency allocation studies for ground based observing systems

(a) Improve coordination of radiosonde operating frequencies between neighboring countries;

(b) Assist in coordination and protection of radiofrequencies for ground-based observing systems, (CIMO-XIII/5.1.12).

C. OPAG-CAPACITY BUILDING

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 comprehensive training on their systems, especially in developing countries, (CIMO-XIII/7.23).**

5. **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.**

   (a) Develop performance measures to demonstrate continuous improvement in the quality of observations, (CIMO-XIII/11.6);

   (b) 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);

   (c) Develop basic procedures for quality management of observations, instrument maintenance, calibration and operational practices, (CIMO-XIII/11.7).

6. **Maintain and update the CIMO Guide (WMO-No 8) and advise on changes required for the Instrument Catalogue**

   (a) Review the table on Operational Accuracy Requirements and Typical Instrument Performance, (CIMO-XIII/4.1.12);

   (b) Assist in the production of an electronic version of the CIMO Guide, (CIMO-XIII/10.5).

7. **Review available and develop new training materials** (CIMO-XIII/5.1.13)

   (a) Review available and prepare additional training material for scientists beginning work in instrumentation development

8. **Review and provide guidance to develop the IMOP capacities of developing countries, in particular the development and fabrication of instruments**

   (a) Encourage development and operation of low-cost, good quality meteorological and hydrological observing systems, (CIMO-XIII/7.25).

9. **Develop proposals for joint procurement mechanisms for consumables to assist developing countries in achieving a reduction in the cost of instrument operation.**

10. **Evaluate technical reports concerning instrument requirements in developing countries generated by namely experts, and provide technical advice on related project implementation.**

11. **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).**