

World Meteorological Organization

CIMO-XIV/PINK 10

**COMMISSION FOR INSTRUMENTS AND METHODS
OF OBSERVATION**

Submitted by: President of the
Commission

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FUTURE WORK AND WORKING STRUCTURE OF THE COMMISSION

Report to Plenary on item 10

REFERENCES:

CIMO-XIV/Doc. 10 and CIMO-XIV/G/WP 10

APPENDICES:

- A. Draft text for inclusion in the general summary on item 10
- B. Draft Resolution 10/1 (CIMO-XIV) - CIMO Open Programme Area Groups (OPAGs)
- C. Draft Resolution 10/2 (CIMO-XIV) - CIMO Management Group

ACTION PROPOSED:

It is recommended that the draft text provided in Appendix A be included in the general summary of the work of the session and that the draft resolutions in Appendices B and C be adopted.

DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF CIMO-XIV

10. FUTURE WORK AND WORKING STRUCTURE OF THE COMMISSION (*agenda item 10*)

10.1 The Commission recalled the decision of CIMO-XIII to establish a working structure that would enable it to meet the needs of Members effectively during the intersessional periods. The progress has been evaluated periodically by the CIMO Management Group (MG) during the past four years. The initial review was conducted at CIMO-MG-2, Bucharest, Romania, 2-3 May 2005, and the final review at CIMO-MG-3, Geneva, Switzerland, 3-7 July 2006. During these meetings the MG took into account CIMO performance and experience gained under the new working structure, recommendations of its Open Programme Area Groups (OPAGs) and Expert Teams (ETs), and conclusions of other WMO constituent bodies, as well as other relevant intergovernmental and non-governmental organizations on issues related to CIMO.

10.2 The conclusions derived at MG-3 were that the new structure was responsive to the needs of Members and the user community. In this regard, the Commission recognized that work programme activities and deliverables of the Commission had increased significantly due to the effective and flexible working structure based on the OPAGs and their 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 the Draft WMO Strategic Plan 2008-2011, 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 MG to establish the membership of the ETs. It invited the chairpersons of the respective OPAG and ETs, in cooperation with the Secretariat, to develop target activities and deliverables as well as an adequate working mechanism to ensure that all experts could actively participate and contribute to the work programme.

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. Monitor and report on progress in development and performance of new surface observation technologies and measurement techniques, for example ultrasonic wind sensors and optical precipitation gauges;
2. In collaboration with the other technical commissions identify siting, performance, classifications and metadata standards for systems and individual sensors used for Synoptic and mesoscale meteorology, Climate, Marine, Agrometeorology, Hydrology, Urban and Roadway purposes. Identify standards for inclusion in the CIMO Guide;
3. Recommend standard observing methods for the automatic measurement of present weather, clouds, the state of the ground and weather phenomena. Advise on optimizing manual and automated methods for reporting present weather, clouds, the state of the ground and weather phenomena. Consult with the HMEI as appropriate;
4. Develop standards for the interoperability of instruments hardware and software to allow easy exchange by users. Consult with the HMEI as appropriate;
5. Evaluate the performance of AWOSs in tropical, arctic, mountainous and desert regions and consult manufacturers on relevant findings to propose improved designs. Advise Members on use of AWOS in extreme climatological conditions;
6. Monitor and review the available algorithms used in AWSs and advise on their possible standardization;
7. Support to DPM in identifying how surface-based technologies can support monitoring of natural hazards, such as high wind speeds and extreme precipitation rates;
8. 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 conditions and combinations of weather conditions; Develop instruments with increased measuring range;
9. Taking into account the environmental concerns of Members using mercury-based instruments investigate alternative solutions and advise Members;
10. Develop guidelines and procedures for the transition from manual to automatic weather stations, including assessment of data homogeneity, and recommend them for inclusion in the CIMO Guide;
11. In cooperation with the HMEI, encourage manufacturers to develop lower power instruments so power sources such as solar and wind can be used more frequently;
12. Respond to requests from relevant CBS ETs to review and report on evaluation calibration requirements for satellite remote sensing of surface variables in line with the development in the WMO Integrated GOS;

13. Update the relevant parts of the CIMO Guide in collaboration with the Rapporteur on the CIMO Guide.

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

1. Act as the International Organizing Committee for Surface-based Instrument Intercomparison (IOC-SBII);
2. Prepare and prioritize proposals for instrument intercomparisons according to the CIMO Provisional Programme of WMO Surface-based Instrument Intercomparisons (2006-2010) and available funds, in particular taking into account ET suggestions and requests from Technical Commissions, GCOS, etc;
3. Prepare an implementation plan for each approved intercomparison proposal, taking into account suggestions from HMEI if required;
4. Coordinate activities related to the organization and conduct of WMO Surface-Based Instrument Intercomparisons according to the CIMO Provisional Programme of WMO Surface-based Instrument Intercomparisons (2006-2010). The emphasis should be placed on the ongoing intercomparisons, namely: the WMO Field Intercomparison of Rainfall Intensity Gauges (Vigna di Valle, Italy, 2007-2008) and the WMO Combined Intercomparison of Thermometer Screens/Shields in Conjunction with Humidity Measurements (Ghardaïa, Algeria, 2007-2008), the latter followed by a similar intercomparison in an arctic environment at Iqaluat, Baffin Island, Canada;
5. Take responsibility for overseeing the evaluation of the intercomparison results;
6. To organize and participate in peer reviews of the intercomparison results before publication;
7. According to intercomparison results, update the recommended standard calibration procedures, including traceability, especially for new measured variables;
8. Take responsibility for producing targeted documents and recommendations for the user communities;
9. Provide technical and scientific advice on surface-based measurements to Members, as requested through the WMO Secretariat;
10. Prioritize and prepare proposals as required from Members suggestions:
 - a) Updated Present Weather instrument intercomparison demonstrating use in tropical environment;
 - b) Deployments of laser ceilometers for integration and use for pilot projects and test-bed studies for future operational upper-air networks (in collaboration with the ET-RSUT&T);
 - c) Develop methodologies for assessment of the dynamic and static uncertainty characteristics of sea-level sensors. A small sample of sensors will be used to develop the techniques and form preliminary intercomparison results. These

will be used to plan and guide a larger scale intercomparison of a wide variety of sensing technologies. The needs of other sea-level users will be included;

- d) In consultation with CCI, Antarctic WG, WCRP-CLiC, WCP, CHy, CAgM, CBS and GCOS, assess the methods of measurement and observation of solid precipitation, snowfall and snow depth at automatic unattended stations used in cold climates (polar and alpine). This includes:
- Documenting the needs of WMO Technical Commissions and Programmes;
 - Compiling, updating and if required, ensuring compatibility of measurement standards and requirements of WMO Technical Commissions for cold climate precipitation measurement;
 - Updating and making accessible all metadata related to precipitation measurement instrumentation at all NMHS AWS operated in cold climate regions, and especially for those countries participating in IPY (A recent WCRP/CLiC survey of their in-situ measurements would provide a guide for information required.);
 - Preparing national summaries of the methods, issues and challenges of automated solid precipitation measurement in cold climate countries;
 - Assessing the need for an intercomparison of methods and equipment for automated snowfall/snow depth/precipitation measurements in cold climate regions, on both global and regional basis, and develop an intercomparison plan) during the IPY period;
- e) Intercomparisons of hydrological gauges to cover both normal conditions and extreme events;
- f) Update the relevant parts of the CIMO Guide in collaboration with the Rapporteur on the CIMO Guide.

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 three CAS SAGs for Ozone, UV and Aerosol and report, as necessary, on the operational practice for measurements of Ozone, UV, Aerosol Optical Depths, and other issues as agreed;
6. Update the relevant parts of the CIMO Guide in collaboration with the Rapporteur on the CIMO Guide;

7. Provide technical and scientific guidance to the WRC Davos for the further development of the World Infrared Standard Group (WISG) of radiometers to ensure the ongoing traceability of atmospheric radiation measurements and coordinate the dissemination of pyrgeometer calibration coefficients;
8. Evaluate the process of the WISG transfer to network measurement of infrared irradiance and if necessary, refine the recommendations on infrared calibration procedures;
9. Respond to instrument and measurement problems reported by WRDC St. Petersburg, Russian Federation;
10. Initiate activities so that radiation measurements in all national radiation networks are of a high quality;
11. Liaise with BIPM and report on the status of the traceability of radiation measurements to SI;
12. Provide technical and scientific advice on surface-based measurements to Members, as requested through the WMO Secretariat by the production of supplementary targeted documents and recommendations for the user community who have requested intercomparisons;
13. Respond to requests from relevant CBS ETs to review and report on evaluation calibration requirements for satellite remote sensing of surface radiation and atmospheric composition variables in line with the development in the WMO Integrated GOS.

B. OPAG-UPPER AIR

B.1 Expert Team on Upgrading Global Upper-Air Networks (ET-UGUN)

1. Monitor systematic performance of radiosonde networks in GOS and liaise with Members and HMEI on performance issues. Reports will be posted annually to the CIMO Website for use by network managers and all users;
2. Investigate options for reducing cost of operational upper-air observations including: cost of radiosonde consumables; the use of interoperable radiosonde systems to improve competitive procurement, reduced use of radiosondes by introduction of other types of upper-air observing systems or adaptive strategies. Promote further the studies on the practical issues of interoperable upper-air systems, evaluate performance of the existing systems and advise Members on appropriate solutions for their requirements;
3. 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, update relevant CIMO Guide chapters, in collaboration with the Rapporteur, and ensure experiences are shared amongst Members;
4. Address the issue related to the operational safety of hydrogen generators used at the upper-air stations and assist R-TA&TM in developing hydrogen safe practice in the future upper-air training workshops. Review alternative sources of lifting gas including natural gas and helium and make recommendations to Members;

5. Review current approved BUFR templates for detailed radiosonde profile reporting and recommend additions to enable a wider range of user requirements to be met, including high resolution 4D reporting, additional metadata and measured parameters only;
6. Undertake all radiofrequency protection activities for all operational upper-air observing systems, including radiosondes, weather radars, wind profilers, microwave radiometers, etc. Liaise with the CBS Steering Group on Radiofrequency Allocation by developing and maintaining a strategy for protecting currently allocated frequencies, in collaboration with members of ET-RSUT&T;
7. Improve the global operational Upper-Air Network, in working with the CBS OPAG-IOS, GCOS and RAs, to identify key areas, such as the tropics, for action;
8. Provide required technical guidance to GCOS, CCI and CBS to enable them to establish the GCOS Reference Upper-Air Network (GRUAN);
9. Provide technical review of evolving AMDAR humidity capabilities as requested by CBS OPAG IOS ET EGOS. Liaise with ET-UASI in developing suitable guidelines for Members following intercomparisons;
10. Liaise with HMEI in recommending solutions for outstanding systematic technical problems with upper air instrumentation.

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

1. Act as the International Organizing Committee for Upper-air Systems Intercomparison (IOC-UASI) according to the CIMO Guide;
2. Prepare and prioritize proposals for instrument intercomparisons according to the CIMO Provisional Programme of WMO Upper-Air Instrument Intercomparisons (2006-2010) and available funds, in particular taking into account ET suggestions and requests from Technical Commissions, GCOS, etc;
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. Take responsibility for overseeing the evaluation of the intercomparison test results;
6. To organize and participate in peer reviews of the intercomparison results before publication;
7. Take responsibility for producing targeted documents and recommendations for the user communities who have requested the intercomparison, including representatives of HMEI, operational network managers, GCOS and GEOSS managers;
8. Provide 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. Liaise 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. Review latest developments in the field of remote sensing technology and report to Members;
2. Review current Wind Profiler Network operational activities, identifying strengths, weaknesses and operational costs. Identify best practices including siting and calibration and quality control, noting the need for close collaboration with users, such as the data assimilation community. Provide improved guidance material for the Members;
3. Work with ET-UASI to design and conduct an intercomparison to evaluate Profiler wind quality;
4. Monitor implementation of Microwave Radiometers as operational systems and report on progress, specifically quality of temperature measurements in the planetary boundary layer;
5. Monitor implementation of GPS Water Vapour Networks as operational systems and report on progress. Evaluate quality of data in suitable intercomparison including radiosonde and microwave radiometer. Develop operational guidelines and recommend suitable operational data exchange protocols;
6. Evaluate and report on the potential of the Raman water vapour lidar as an operational upper-air observing system for the troposphere;
7. Facilitate activities associated with improving the quality of weather radar operations, including signal and data processing, by initiating a series of intercomparison workshops exercising radar algorithms on common data sets;
8. Establish a Web based up-to-date fully comprehensive database of the global use of weather radar;
9. Provide guidance on weather radar siting and operation with respect to wind turbines and sources of radiofrequency interference;
10. Review current weather radar network data exchange methods and make recommendations on the preferred method to be adopted by WMO for international exchange, noting OPERA's BUFR implementation and its limitations;
11. Respond to requests from relevant CBS ETs to review and report on evaluation calibration requirements for satellite remote sensing methods in line with the development in the WMO Integrated GOS;
12. Review current operational lightning detection networks, and report on strengths and weaknesses, including coverage, accuracy, reliability and cost effectiveness. Undertake Moroccan intercomparison of existing systems and make

recommendations for enlargement of the networks to poorly covered areas, such as Africa;

13. Working with ET-UASI initiate a series of pilot projects and testbed studies to establish the principles for the optimal mix of sensing systems to improve both temporal and spatial capabilities for future operational upper air networks, noting the need for close collaboration with users, specifically the data assimilation and NWP communities;
14. Review and update existing training material and support OPAG-CB in the production of suitable training workshops, reference material and guidelines for all operational aspects of remote sensing systems.

C. OPAG-CAPACITY BUILDING

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

1. Determine the status of the traceability of surface-based measurements to SI and develop a strategy towards ensuring worldwide traceability of measurements to SI;
2. Develop criteria for regular evaluation and establish metrics for assessing RIC performance;
3. Recommend instruments for use by RICs for calibration of meteorological and related environmental instruments;
4. Engage manufacturers in developing RIC technical procedures for instrument calibration and instrument maintenance;
5. Collaborate with the RICs in defining RIC functional capabilities;
6. Strengthen the Quality Assurance of the RICs/RRCs as a crosscutting issue involving the regional and technical cooperation activities as well as GCOS;
7. Identify the need for regional workshops on metrology;
8. Develop a methodology for conducting intercomparisons between legacy and next generation calibration instruments as well as between different calibration tools;
9. Encourage RICs to organize and/or participate in the inter-laboratory comparisons at appropriate time intervals;
10. In collaboration with RAs, establish RIC selection criteria, qualification and evaluation procedures, including procedures for rectification of problems when necessary;
11. Improve procedures for quality management of observations, instrument maintenance, calibration and operational practices;
12. Monitor the capabilities and functions of the RICs through yearly reports and 5-year evaluation of the RICs and inform relevant Members and presidents of RAs;

13. 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;
14. Recommend the optimum network of suitable RICs for calibration in Regions, taking account of current and future capabilities;
15. Review and provide guidance to develop the IMOP capacities of developing countries, in particular the development and fabrication of instruments;
16. 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, update and develop training materials, conduct CIMO training and capacity building activities and provide training materials on CD ROMs to Members;
2. Assist in implementation of CIMO training and capacity building events, such as training workshops on upper-air measurements (depending on the available resources and concentrating on Regions where training has not yet been held), technical conferences such as TECO and METEOREX;
3. Cooperate in the organization of instrument related workshops and seminars co-sponsored by WMO, such as the International Conference on Experiences with AWS (ICEAWS);
4. Cooperate with the RMTCs/RICs/RRCs in promoting training courses related to instruments and methods of observation, with a special emphasis on automated observing systems, radar systems, instrument maintenance and calibration;
5. Arrange for the publication of training material, used in the above training, under IOM Report series;
6. 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;
7. Develop further the training components within the CIMO/IMOP Web Portal, with inputs from HMEI as appropriate;
8. Cooperate with manufacturers, RICs and RRCs in promoting attachments / on-the-job training of instrument specialist from developing countries;
9. Develop training material for technicians on the maintenance and use of various individual instruments, for instance, Automated Weather Observing Systems (AWOSs), meteorological radars and algorithms for use by AWOS. Request input from instrument manufacturers;

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

1. In collaboration with CIMO OPAGs, ETs, HMEI and the Secretariat, coordinate activities aimed at periodic updating of 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 revisions to the 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 CIMO OPAGs, ETs and 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, encourage conducting of 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 and remote locations.
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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)
Mr K.-H. Klapheck (Germany)
- A.2 Expert Team on Surface-Based Instrument Intercomparisons and Calibration Methods (ET-SBII&CM)
Mr M. Leroy (France)
- A.3 Expert Team on Meteorological Radiation and Atmospheric Composition Measurements (ET-MR&ACM)
Mr B. Forgan (Australia)

B. OPAG-UPPER AIR

- B.1 Expert Team on Upgrading Global Upper-Air Networks (ET-UGUN)
Mr D. Helms (USA)
- B.2 Expert Team on Upper-air System Intercomparisons (ET-UASI)
Mr T. Oakley (United Kingdom)
- B.3 Expert Team on Remote Sensing Upper-air Technology and Techniques (ET-RSUT&T)
Mr D. Engelbart (Germany)

C. OPAG-CAPACITY BUILDING

- C.1 Expert Team on RICs, Quality Management Systems and Commercial Instruments Initiatives (ET-RICs)
Mr J. Gorman (Australia)
 - C.2 Co-Rapporteurs on Training Activities and Training Materials (R-TA&TM)
Mr E. Büyükbas (Turkey)
Mr B.Y. Lee (Hong Kong China)
 - C.3 Rapporteur on CIMO Guide (R-CIMO-Guide)
Mr I. Zahumenský (Slovakia)
 - C.4 Rapporteur on Regional Implementation Activities (R-RIA)
Mr G. Srinivasan (India)
 - C.5 Rapporteur on Climate Observation (R-CO)
Mr B. Baker (USA)
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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: Mr J. van der Meulen (The Netherlands);
 - Co-chairperson: Mr B. Calpini (Switzerland);
 - (b) OPAG on Upper-air Observation Technology:
 - Co-chairperson: Mr H. Zhou (China);
 - Co-chairperson: Mr R. Stringer (Australia);
 - (c) OPAG on Capacity Building:
 - Co-chairperson: Mr M. Nbou (Morocco);
 - Co-chairperson: Mr M. Garcia (Argentina);

Decides further:

- (1) To establish a CIMO Coordinator for the Global Earth Observing 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 contributing to the development and implementation of 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 periodic status reports on CIMO related activities and recommendations on newly identified requests to the Commission on GEOSS related activities;
- (2) To select Mr A. Gusev (Russian Federation) 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 Mr R.P. Canterford (Australia) 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 Quality Management Framework (QMF) practices and advise Commission members on activities contributing fully to the QMF Programme and to ensure that CIMO technical activities cover all aspects of product delivery and data services specified under the WMO policy on quality;
 - (b) To provide the CIMO Management Group with appropriate information and recommendations on the Commission's QM and QA related activities;
 - (c) To provide the president with an annual report for Congress and EC as to CIMO's progress and achievements related to QM activities;
 - (d) Monitor progress of the development of the WMO QMF across the technical commissions and represent CIMO in the Intercommission Task Team (ICTT) on QMF;
 - (e) Review and assess the experience of NMHSs with QM and QA;
 - (f) Coordinate the consolidation and updating of CIMO technical standards and recommended practices;
 - (g) Collaborate with ISO and BIPM in the standardization activities of the Commission;
 - (h) Provide support for the harmonization of terminology in technical guidance documents (technical regulations, manuals, guides, guidelines, technical documents)

of WMO and of possible joint ISO-WMO technical standards relating to instruments and methods of observation;

- (6) To select Mr U. Busch (Germany) to serve as the CIMO Coordinator for WMO QMF;
- (7) To establish a CIMO Coordinator for Cross Programme and Intercommission work relevant to IMOP, with the following Terms of Reference:
 - (a) To coordinate Commission activities, across the relevant WMO Programmes, related to the implementation aspects of the IMOP;
 - (b) To coordinate with regional associations, technical commissions and with the WMO Secretariat on relevant WMO developments to ensure CIMO input, e.g., WMO Strategic Plan 2008-2011;
 - (c) To provide the CIMO Management Group with appropriate periodic status reports on CIMO related activities and recommendations on cross programme areas relevant to the Commission;
 - (d) To ensure the work of CIMO Expert Teams is input to other WMO Programmes and Commissions (e.g., CHy and JCOMM);
 - (e) To provide input to the evolving role and enhancement of WMO with respect to IMOP;
- (8) To select Mr E. Bazira (Uganda) to serve as the Coordinator for the Cross Programme and Intercommission work relevant to IMOP;

Requests:

- (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 DRAFT 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 performance results and recommendations relating to the state-of-the-art of operational instruments, their calibration and methods of observation as well as their use in different application areas.
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 user requirements and recommend appropriate action of the Commission, including provision of guidance material.
5. Support 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 instruments and observing systems for use in WMO and national procurements.
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 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. Develop further basic procedures for quality management of observations, instrument maintenance, calibration and operation (based on the seventh edition of the *WMO Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8) (CIMO Guide).
17. 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 organizations, 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 (RICs).
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 RICs, RRCs and 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 seventh 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 Instrument 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).
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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 the president in planning and coordinating the work of the Commission its Open Programme Area Groups and Expert Teams;
 - (c) To plan, coordinate and actively manage the work of the Commission, its Open Programme Area 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 DPM;
 - (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 (DPM);
 - (e) The CIMO Coordinator for Global Earth Observing System of Systems (GEOSS);
 - (f) The CIMO Coordinator for WMO Quality Management Framework (QMF);
 - (g) The CIMO Coordinator for Cross Programme and Intercommission work relevant to IMOP.
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