WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION

ADVISORY WORKING GROUP

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21 to 25 January 2002

FINAL REPORT
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1 ORGANIZATION OF THE SESSION

1.1 Opening of the session

The session of the Advisory Working Group (AWG) was held at the Headquarters of the World Meteorological Organization (WMO) in Geneva, Switzerland, from 21 to 25 January 2002. The lists of participants and their addresses are attached as Appendix A and Appendix B.

Professor Hong YAN, Assistant Secretary-General, opened the session of the AWG on behalf of Professor G.O.P. Obasi, Secretary-General of WMO, on Monday, 21 January 2002, at 10.00 h. He welcomed the delegates and was pleased that WMO was able to host this session in its new Headquarters Building. Since not much time was left to accomplish the comprehensive work until the forthcoming thirteenth session of CIMO (CIMO-XIII) planned to be held in autumn 2002, Professor YAN underlined that this meeting was a unique opportunity to finally co-ordinate the work and prepare CIMO-XIII.

He highlighted some of the critical elements of the working programme, such as that an active collaboration with the other technical commissions of WMO and relevant bodies outside WMO was essential for co-ordinating the common requirements related to meteorological instruments. He was convinced that this inter-commission collaboration is becoming more and more crucial in the future. Professor YAN was pleased to note that CIMO had already established close relationships with CBS, CAeM and CAgM and encouraged the AWG to develop these further, as well as to include in the plans the instrument and equipment industry, as appropriate. He noted with appreciation that expert meetings have successfully been convened to address new requirements, and last but not least, that the preparation and running of instrument intercomparisons were successful, such as the Intercomparison of GPS Radiosondes, held in Brazil last year.

Professor YAN also underlined the importance of the Guide to Meteorological Instruments and Methods of Observations, known as the "CIMO Guide", as the basic publication for all who measure meteorological variables professionally. He was pleased to learn that an update of this Guide and the implementation of a few new chapters were planned to be undertaken prior to the Commission session to better meet users' needs.

Professor YAN encouraged CIMO to continue the activities aimed at bridging the gap between developed and developing countries, as initially started by its president through an Expert Meeting on Capacity Building held in Beijing, China, in 1999. He also highlighted that CIMO significantly contributed to the technology transfer through the technical conference TECO-2000, held in Beijing together with the exhibition METEOREX-2000. He underlined that these technical conferences are recognized to be very efficient, and promised that the WMO Secretariat will do its utmost to continue the organization of such events in the future, noting that the next one will already be held in conjunction with CIMO-XIII in Bratislava, Slovakia, this autumn. Professor YAN underlined that the WMO also significantly supported CIMO's efforts to involve more intensively instrument manufacturers and suppliers in the work of the Commission, which will in the future surely be enhanced through the newly established Association of Hydro Meteorological Equipment Industry (HMEI). In this context, he also mentioned the "Instrument Catalogue" which is an important tool for facilitating the work of NMHSs. He noted with appreciation that it was produced and distributed by the China Meteorological Administration (CMA) and is now already in the process of update towards the publication of a revised second edition. He encouraged the AWG to continue efforts in enhancing the capabilities and role of the 13 Regional Instrument Centres so that the NMHSs can obtain the maximum benefit from these centres for their observing networks.

Finally, Prof. YAN assured the meeting the full support of the Secretariat in its work and wished the participants a successful session and a pleasant stay in Geneva.

Dr S.K. Srivastava, president of CIMO, thanked Professor YAN for his kind and encouraging words. He noted with appreciation the good facilities provided for the session and support offered. He promised that the AWG would do its utmost to meet best users’ needs.
1.2 Working arrangements for the session

The session determined its working hours and the participants were informed on the local arrangements. English was selected as the working language.

1.3 Adoption of the agenda

The Chairman introduced the Provisional Agenda and invited the participants to provide comments. The Working Group adopted the Agenda as basis for its work with the understanding that it could be amended during the session, if necessary. The finally agreed Agenda can be found in front of this report. A list of documents prepared for the AWG session can be found in Appendix C.

2 STATUS OF THE INTERSESSIONAL WORK

2.1 Report of the president of CIMO

2.1.1 Report of the President

The president reported that during the intersessional period the following items concerning IMOP and CIMO dominated in the deliberations of sessions of the Executive Council (EC), of the WMO Congress (Cg) and of the annual Meetings of the Presidents of Technical Commissions (MPTCs):

- Merging CIMO with CBS as a first step toward restructuring of WMO was strongly put forward by the EC Working Group on Long-term Planning (WG-LTP) which was, however, not found acceptable by Congress as this isolated action did not meet the objectives of restructuring of WMO. Considerable efforts were made by the president and vice-president to assist EC and Cg to come to this logical conclusion.

- Urban meteorology was of great interest to all the technical commissions (TCs) and the members of EC. In order to meet the requirement Co-rapporteurs have been nominated by the president.

- Capacity building, education and training and technology transfer through the Regional Instrument Centre (RIC) mechanism was in focus at almost all sessions of the EC. This needs further serious deliberations at the AWG session. The efforts of CIMO in the area of capacity building and technology transfer through technical conferences TECOs and instrument exhibitions METEOREX received full support and recognition by all concerned. Especially the arrangement of the events hosted by CMA in Beijing, China, in 2000 was highly appreciated.

- Significant efforts were made to enhance the inter-commission cooperation. Some met with success, such as CCI, CHy and CAgM showed lot of interest in AWS work while CCI was specifically interested in urban meteorology issues. The collaboration of CIMO with CBS was intensified, however, some more efforts will be needed to cultivate closer contact with which was emphasised by EC and WG-LTP.

- The assembling and publication of the Instrument Catalogue by CMA attracted much deserved attention from Members and other users. Further upgrade of this catalogue is felt to immediate necessity. It was noted with appreciation that CMA is willing to undertake this task still prior to CIMO-XIII.

- The involvement of manufactures in the WMO / CIMO activity was long felt needed. CIMO was facilitating the participation of manufacturers of upper-air equipment in the relevant sessions of the Upper-air Working Group as observers. The president and vice-president of CIMO, in close collaboration with the WMO Secretariat, met with manufactures to convince and support them to form a related association so that they can apply for an "observer" status in sessions of WMO constituent bodies. It is understood that such an association has now been formed.

- Members of EC emphasised the need for instrument intercomparisons according to the actual needs to ensure quality of data generated by the observational network with special
reference to quality of GPS radiosondes. EC was informed about the action being taken on the issue.

- Some problems were encountered to carry the technical work assigned during intersessional period due to lack of timely communication and feed back from the Members. The work of the Co-rapporteurs on Weather Radars could not be well established due to this reason. It will be worth considering a flexible structure of the working mechanism during next intersessional period for timely completion of tasks.
- The president highlighted that details of most of these items have been contained in the Circular Letters and are reflected document Doc 10.1 to be discussed under Agenda Item 10.1.

2.1.2 Report of Co-rapporteurs on Weather Radars

The AWG noted with some concern that no report has been delivered by the Co-rapporteurs on Weather Radars, Messrs, Vashistha, India, and Suzuki, Japan. Following the discussions related to the missing activities of the Co-rapporteurs, it was agreed to accept the offer for assistance from R. Dombrowsky and J.P. Van der Meulen both members of the AWG. These volunteers intend to support the Co-rapporteurs in their work needed to meet the objectives, such as calling for a review of Chapter 9 "Radar Measurements" of Part II of the CIMO Guide as well as the provision of a summary of work accomplished by the Co-rapporteurs for submission to CIMO-XIII. This will also include a revised work plan for meeting the Terms of Reference for these objectives (intended to be accomplished by 1 April 2002).

2.1.3 Report of the Co-rapporteurs on Urban Meteorology

The AWG noted with appreciation document 2.1(1), which contains the 2001 Progress Report of the Co-rapporteurs on Urban Meteorology. It agreed that the preparation of the new Chapter on "Urban Meteorology" for inclusion in Part II of the CIMO Guide should get highest priority while the preparation of a publication reflecting the results of the evaluation of the replies received to the WMO Inquiry within the IOM series should be done at a later stage. The already existing concise evaluation document should be put as an interim version on the CIMO Web-Site for preliminary information of the nominated national contact persons in this field. They should be informed on its availability by E-mail. Depending on the feed back and time available by the Co-rapporteurs, a publication in the IOM series might be considered for publication still prior to CIMO-XIII. The president agreed to write a letter to the Co-rapporteurs and inform them on the relevant results of the AWG session.

2.1.4 Report of Rapporteur on Atmospheric Ozone Measurements

The AWG noted with appreciation document 2.1(2), which contains the 2001 Progress Report of the Rapporteur on Atmospheric Ozone Measurements. However, it was found that matters on surface-based ozone measurements have not sufficiently been reflected yet and that issues on Brewer and Dobson spectrometers may need more considerations. Regrettably, the report does not sufficiently refer to efforts of some other regions than Europe in operating Ozone networks operationally. Furthermore, considerations on Ozone-Sonde comparison are not yet reflected. It was also noted that there was not yet a sufficient contact established between the Rapporteur and the Upper-air Working Group as well as with the Rapporteur on UV Measurements. The AWG also discussed issue related to the responsibilities for operation of Ozone networks, while this is still under the auspices of the GAW / CAS. It agreed that considerations might be undertaken that matters on related instrumentation might be transferred to CIMO’s responsibility in the near future. The president is invited to send a letter to the Rapporteurs and inform them on the results of the AWG session which also contains a request to make the necessary updates of Chapter 16 "Measurement of Ozone" of Part I of the CIMO Guide.
2.1.5 Report of Rapporteur on UV Measurements

The AWG noted with appreciation document 2.1(3) containing the Progress Report of the Rapporteur on Atmospheric Ozone Measurements. It was considered that comparisons of UV spectrometers are expensive and the results are deemed suspect without the proper methodology. International comparisons of both broadband and narrow-band instruments are not sufficiently carried out yet. The president was invited to contact the Rapporteur and inform him on the relevant results of the AWG, especially to take care on the update of Chapter 7 "Measurement of Radiation" of Part I of the CIMO Guide. The president of CAS will be informed by the president of CIMO on the need for an enhanced collaboration between both commissions towards a better solution for the benefit of all concerned.

2.1.6 Report of the Rapporteur on Atmospheric Composition

The AWG noted with pleasure the report of the Rapporteur on Atmospheric Composition as contained in document 2.1(4), although it has been received at a late stage. It noted the importance to inform CIMO on the ongoing matters in this field of high interest and agreed that his report should be prepared for CIMO-XIII along the lines as provided.

2.2 Reports of the members of the AWG on the status of the work accomplished according to the allocated tasks, including the Co-rapporteurs on Capacity Building

The members of the AWG, with the exception of Mr Salamanca (Columbia), who was not able to attend the session, provided their individual reports to the AWG. These reports are briefly summarized as follows:

2.2.1 Report of the Co-rapporteurs on Capacity Building

The AWG took note of the progress reported provided by the Co-rapporteurs on Capacity Building as reflected in Doc. 2.2(1). It has been noted with some concern that insufficient support was given to the instrument programme within the Regions. It has, therefore, been agreed that a statement of the president of CIMO is not needed anymore to nominate regional rapporteurs on solar radiation, but rather to concentrate on regional rapporteurs related to Capacity Building issues who are looking at all matters related to the regional implementation of IMOP, similarly to the successful CBS procedure. It has been agreed to prepare a questionnaire for obtaining information on the performance of RICs, to be posted by the president of CIMO to the RICs and copied for information to those PRs who are responsible for an RIC (see Agenda Items 3. and 5. below as well as Appendix D). It has also been agreed by the session that based on the replies received a proposal should be developed by the AWG still prior to CIMO-XIII for encouraging the RICs to enhance their performance. Furthermore, activities should be initiated in obtaining information from the Associations on their specific regional needs addressed by RICs, which are relevant to meteorological instruments and methods of observations aiming to an improvement of observations. Based on the present status of the work, abilities and services of the RICs, there is a need to select the most suitable ones for operation on a higher level of performance to cope best with the regional needs.

It was proposed to consider, as far as feasible, the organization of a meeting of heads of the RICs, preferably in conjunction with CIMO-XIII / TECO-2002, with the main objective to facilitate their contacts and to consider on how to tackle best the increased needs (see also Agenda Item 5. below).

Further to this, the AWG felt that a review mechanism for an assessment of the performance of RICs has to be proposed and carried out by either the Region or CIMO. Such an approach requires an approval by EC. Possible examples of applicable procedures, at least partly, may already exist, such as established for Regional Climate Centres (RCC), for Regional Meteorological Education and Training Centres (RMTC) and Regional Specialized Meteorological Centres (RMSC). This challenging, but necessary, mechanism for RICs should be proposed by the AWG, to be developed by an ad-hoc group led by the Vice-president, involving the Co-rapporteurs on Capacity Building and other volunteers, and carried out in close collaboration with the WMO Secretariat. The objective should be to draft a proposal with recommendation for
consideration at CIMO-XIII, so that EC-LV may consider its approval. Such an approach will give an officially approved mechanism for the nomination of these centres, for their regular certification and for monitoring their performance. It was confirmed that especially the challenging new tasks given by EC-LIII to CIMO (see Agenda Item 3. below) require centres that are able and willing to perform the Capacity Building issues, as well as the requested support for Members, on their own without any further support from outside. Annual Activity Reports should be delivered to the president of the Region concerned as well as copied to the president of CIMO. The main purpose of this activity is to get a new mandate towards improving the quality of observations. Under the management of a capable expert each RIC has to set up its individual target matrix on performance.

The AWG further referred to capacity building issues of great interest, namely to the need for an update of the WMO publication IOM Report No. 68 (WMO/TD-No. 87) "Guidance Material on the Choice of Meteorological Instruments for the Surface Observations Suitable for Use in Developing Countries". The session has been informed that it has already slightly been revised but it was agreed that this version is not yet valid to be published as a new edition, since there were, in addition to some editorial amendments, no significant changes inserted. Therefore, this version should be put on the WMO / CIMO Web-Site, and be announced in the next Circular Letter of the president of CIMO as well as indicated at the CIMO report. Experts of NMHSs should be invited to provide comments, proposals for amendments and supplements.

Related to the report of the Co-rapporteurs for submission to CIMO-XIII, it has been agreed that it should be presented as an independent document. Within this document a recommendation should be contained aiming to an enhancement of the service and performance of RICs.

2.2.2 Report of the Working Group on Ground-based Upper-air Observing Systems

The AWG received the comprehensive report of the chairman of the Working Group of Ground-based Upper-air Observing Systems as contained in Doc. 2.2(2). The AWG noted with thanks the large contributions of Members in supporting the WMO Intercomparison of GPS Radiosondes held in Brazil in 2001, especially that of the host country, as well as of manufacturers which provided extensive resources. This radiosonde test had been enlarged at the request of the manufacturers to include five different types of GPS radiosondes, partly with chilled mirror hygrometers providing additional information on relative humidity measurements. More than 40 successful test flights were obtained. The basic test data from the flights have been validated, timing and software errors corrected, and circulated to all the parties involved in the test. The data sets were supplied with software that allowed the basic statistics from the comparison to be computed. The experts from the host country were now preparing the preliminary report on the highlights of the test with the intention for making it available prior to CIMO-XIII.

The preliminary evaluation results obtained from the WMO GPS Intercomparison confirmed that windfinding systems decoding the GPS signals are potentially more reliable than the current codeless systems, and it is expected that all manufacturers will offer decoding GPS systems within the foreseeable future. Thus, the AWG agreed that there was no reason to continue detailed testing at this time until the newly designed decoding systems were in widespread use.

The AWG was briefed on the results from a WMO questionnaire on the performance of GPS radiosondes circulated to Members in 2000. These have been analyzed and a concise report, reflecting the main results, was placed on the WMO / CIMO Web site. This shows that although failure rates are now much lower than in 1999, while they are still higher than should be accepted in the long term. The report also contains useful information on the prices of GPS radiosondes paid by Members. It became obvious that purchasing relatively large numbers on a regular basis clearly results in a cost benefit to the users.

There have been significant advances in the development of several ground-based remote sensing techniques. It is planned that several detailed reports by the relevant rapporteurs working within this Working Group will be provided to Members through the WMO / CIMO Web page still before CIMO-XIII.

In conclusion, taking into account ongoing developments of new radiosonde systems by some manufacturers within countries like China and India, Dr. Nash noted that it would be
essential to organize another WMO Radiosonde Intercomparison within the next 5 years to allow an international testing of these national systems currently under development.

The AWG was informed that one outstanding problem, which needs to be resolved, is an agreement on common structures and code tables for the representation of radiosonde messages in BUFR. BUFR coding of radiosonde messages is considered essential by many Members when introducing a new generation ground systems. TEMP messages currently provide a poor representation of the measurements, since radiosonde measurement quality has improved dramatically since the TEMP code was originally derived. This work needs to be performed so that users only have to use one set of decoding software when archiving and utilizing the radiosonde data from the incoming BUFR messages. This is not a critical issue for the actual transmission of the message since BUFR is very flexible. The manufacturers wish to use the BUFR code to include housekeeping information on the ground system’s status, so that central monitoring of radiosonde ground system health and software status is improved. The expertise to adequately discuss and resolve this issue does not fall entirely within the current Working Group. The AWG agreed that a joint meeting with radiosonde experts, radiosonde manufacturers and CBS coding experts needs to be organized to resolve the issues.

Dr. Nash noted that training was required for national experts in all Regions. Future organization of CIMO work should take into account that most national experts working on specific topics would only be available for a few years before they progressed into other specialist or management areas.

Comprehensive IOM reports which are intended to be published prior to CIMO-XIII either in CD-ROM format or simply to be put on the WMO/CIMO Web-Site are:

- “Radiosonde Data Compatibility”
- “Calibration of Satellite Remote Sensing”
- “GPS-derived Precipitable Water Vapour Contents of the Atmosphere”
- “Wind Profilers”
- “Radiosonde Humidity Sensor Intercomparison (1995)” and
- “GPS Radiosonde Intercomparison (2001)”

It has been agreed that the *Rapporteurs on Calibration of Satellite Remote Sounding Systems, Atmospheric Turbidity Measurements* and *Wind Profilers* should prepare their individual reports for, and if possible present them at, CIMO-XIII while the results of the work of the *Rapporteur on Radiosonde Data Compatibility Measurements* will be inserted within the report of the chairman of the Working Group.

### 2.2.3 Report of the Working Group on Surface Measurements

The AWG considered with interest the report of the chairman of the *Working Group on Surface Measurements* as contained in Doc. 2.2(3). He informed the session that with the exception of a few members of the Working Group, most were newly nominated experts compared with the previous intersessional period. This didn't facilitate the challenging work, especially since only one session of the WG was held in August 2001. Moreover two members of the Working Group were withdrawn from the work by the Member countries concerned while only one of them could be replaced. The chairman underlined that although E-mail communication between the chairman and the experts is useful, it cannot replace meetings, especially in considering the above composition, because they are far more fruitful and effective. He then underlined that although much guidance material was published by CIMO so far, requests have been received to develop further information. From this and other experience obtained he concluded that within the meteorological community limited knowledge exists on the availability of valuable documentation related to IMOP. Moreover he informed that publications issued by other commissions dealing with observations, are partly not in line with the recommended standards developed by CIMO. Even worse, in the report of the meeting of the *CBS Expert Team On Data Representation And Codes* (April 2001), variables and observations techniques were presented which significantly deviate from WMO recommendations. He highlighted that in line with IMOP, publications should become available in open literature to make it more easily accessible to the public. In conclusion, the AWG agreed that CIMO should be more progressive in presenting the recommended practices to the other WMO bodies.
In this context he also underpinned the need that RICs should play a crucial role in the process to guarantee the quality of observations and, as a result, to improve the performance of the GOS. Calibration procedures and the traceability to international standards are especially important items, covered by the WMO Technical Regulations.

The AWG agreed that the development of new automatic observing techniques is presently one of the major issues of interest of Members. Special attention to these issues was given at the technical conferences TECO-2000 (Beijing, China) and ICEAWS (Vienna, Austria). Therefore, reporting on it is a crucial task within the terms of reference of the Working Group. Dr Van der Meulen informed that the publication of the 7th edition of the Instrument Development Inquiry is intended to be finalised prior to CIMO-XIII.

He informed the session that, as requested by CIMO-XII, two expert meetings were organized. The first one was commonly organized by CIMO and CBS dealing with Requirements and Representation of Data from AWS, which resulted in a number of recommendations presented at CBS. Especially the recommendation not to represent observations as subjective indicators, but only as quantitative values, which can easily be realized by using the BUFR code is of specific importance for CIMO. In addition to this, the Expert Meeting on Rainfall Intensity Measurements confirmed the organisation of an intercomparison of rain intensity gauges, as suggested by CIMO-XII. This meeting also developed proposals for required accuracies (or uncertainties) within specified ranges of rain intensity.

Dr Van der Meulen briefed the AWG on intercomparisons that were held or are still in preparation. Two intercomparisons on radiation measurements were finalized while an intercomparison of long-wave radiation instruments was suggested to be held in the near future, which seems no to be possible since such instruments are considered to be stable enough for operational applications. Furthermore, an Intercomparison on Rain Intensity Measurements will be commenced, but should be carried out as a laboratory calibration activity first before a comprehensive field test might be planned. Finally, a combined Intercomparison of Thermometer Screens And Hygrometers is tentatively planned to be held in 2002, taking into account the support required from a number of RICs, since this intercomparison should be done in various climatic regions. Although new developments in instrument development are evident (e.g. solid state wind sensors, ceilometers), the Working Group did not suggest any other new intercomparisons, because of the limitation of human and financial resources to organize such activities and the readiness of Services hosting these tests.

He informed the session that four questionnaires were sent out (related to recording precipitation gauges, road meteorological observations, instrument development and algorithms used in AWSs). The evaluation results of these questionnaires are intended to be published as IOM reports still prior to CIMO-XIII and will provide the experts with the requested information. Reference was also made to the publication of the Instrument Catalogue, issued by CMA, to provide Members with information on currently commercially available instruments and observing systems.

The chairman informed about the substantial support provided by the representatives of four other technical commissions working within the Working Group, which was also found to be essential in assisting other WMO programmes. Furthermore the Working Group could provide information to 3 technical commissions through the president of CIMO according to requests received. Finally, the chairman informed about the current workplan and deadlines for the individual members or sub-teams of the Working Group to obtain the required working results as stated in the terms of reference for consideration by CIMO-XIII. He informed in this context that individual reports are planned to be given by the chairman, which will include the working results of the Rapporteur on Development and Implementation of Automated Observing Systems, while for all other fields allocated to the rapporteurs individual reports will be presented.

2.2.4 Reports of individual members of the Advisory Working Group

- Concise report of the vice-president of CIMO

Dr Canterford reported on the support provided for the president in the operations of the IMOP. He described the organization of arguments for the continuation of CIMO as a
separate commission of WMO as opposed to the merger with CBS. Material was given to the president for inclusion in a paper sent to all PRs and also for his presentations at EC and Congress. As all would be aware, the merger was not considered the best way forward for WMO and that the work of CIMO would be diluted if it was included in a larger commission. However, it was recognized that additional efforts are needed by CIMO officers in presenting excellent working results, to convince the meteorological community on the need to maintain CIMO as a separate technical commission.

He also briefly described the operation of IMOP in the intersessional period and some of the accomplishments. This relates, among others, to two additional RICs that provide services for RA V. In addition, a great deal of effort has been expended trying to boost the activities of RICs and providing further guidelines on their operation. This will be described in more detail under Agenda Item 5. However, it has been agreed that more formal arrangements are necessary to have them operate correctly. They are essential for ensuring the integrity of climate and aviation observations in particular. The formal arrangements will be addressed in a separate document to be presented to CIMO-XIII.

CIMO provided support for establishing the Instrument Catalogue published on CD-ROM, as successfully done by CMA. The Catalogue has now been provided to all Member countries and a second updated version is being planned by CMA.

The vice president also reported on the success of TECO-2000 and the associated exhibition METEOREX-2000. These assisted greatly capacity building efforts, as instrument specialists from many countries were able to attend through additional contributions of some developed countries. In addition, many manufacturers exhibited and this provided an excellent opportunity for the developing country experts to discuss instrumentation issues directly with them. A side meeting arranged by the President of CIMO, assisted by the Secretariat, led finally to the establishment of the Association of the Hydro Meteorological Equipment Industry (HMEI), achieved in autumn 2001. HMEI will be extremely useful for all Member countries.

Support was also provided for the Y2K transition of instrumentation, which was fed to CBS for consolidated WMO guidance.

The International Programme Committee (IPC) has been reformed for TECO-2002, with the addition on local expertise. A call for papers has already been sent and the IPC has met during this AWG session to develop in preparation of TECO-2000 a very tight schedule of paper assessment and programme planning.

The major Expert Meeting on Capacity Building, held in Beijing in 1999, made several suggestions for improvements and these are discussed elsewhere. Presidents of Regional Associations were approached to try and raise the profile of their RICs. However, it was considered with some concern that this did not result in any improvement. Therefore it has been decided to suggest a more formal mechanism for monitoring the work of RICs via direct assessment of activities by CIMO which has to be approved by EC. A paper is intended to be prepared for consideration at CIMO-XIII with a suggested recommendation. This is essential if the core of work undertaken by CIMO through the standardisation of measurements is to support other commissions, especially CBS, CAEM, JCOMM and CCl.

- Mr Dombrowsky provided the following information

He informed the session that a review of the Guide to Meteorological Instruments and Methods of Observation (WMO-No. 8) was undertaken to identify chapters in need of revision. Other members of the Advisory Working Group, including the chairpersons of the Working Groups on Upper Air and on Surface Measurements, were encouraged to submit comments. In the Circular Letter #3 (March 2001) of the President of CIMO, sent to all members, a similar request was made for comments. Unfortunately, no proposals for amendment were received in response to this letter. However, extensive comments were collected from experts through the efforts of the chairpersons of the working groups and the assigned Advisory Working Group focal point. The comments were then merged and provided to the WMO Secretariat. Revisions were suggested in 20 of the 32 chapters of the Guide. Many of the comments involved technical corrections or clarifications. There were
also instances where the instruments described are obsolete, or new technology has become available. An activity to accomplish these revisions is now required. In many cases, suggested rewording of the document was provided by the reviewers. The relevant CIMO working groups or rapporteurs should review the proposed changes.

It could be reported there had been no obvious interruption in the provision or quality of data and products produced by WMO Members due to computer problems resulting from the transition to the year 2000. This was accomplished due to the hard work of Members in successfully trying to avoid such problems.

- Brief information given by Mr Gusev

He informed that the development of proposals for a composite observing system by integrating all available measurements in new observing techniques has been progressed. Specific attention was given by CBS to this issue (see WWW Report No. 20, WMO/TD No. 1040 "Observing Systems Technologies and their use in the next decade"). But the necessary requirements have still to be transferred to CIMO to widely prevent any duplication of work.

- Brief information given by Mr Belhouji

He provided his report related to the allocated task on Capacity Building, Education and Training and related to the work of RICs (see Doc. 5). It was discussed in more detail under Agenda Item 5.

2.3 Reports on results of expert meetings, intercomparisons, workshops, information on publications, etc.

The session has been briefed by the chairmen of the two working groups and the WMO Secretariat on results of expert meetings held, on intercomparisons accomplished as well as on activities in preparation of tests, on the status of preparation of publications within the WMO IOM Report series, on any other activities and further plans in these fields relevant to the tasks of the AWG. It can be summarized as follows:

Dr Van der Meulen reported on intercomparisons (see Doc. 2.3.(1)) and on expert meetings held (see Doc. 2.3.(2)).

The AWG noted with some concern that the only publication, which has been published within the IOM series in the intersessional period so far was the pre-print of papers presented at TECO-2000 (IOM-Report No. 74). Regrettably, other publications that were already planned to be prepared for publication following CIMO-XII by members of the two working groups have not yet been finalized. All experts concerned are called upon to submit their papers as early as possible so that the publication and dispatch can still be handled in a timely manner prior to CIMO-XIII. The AWG would find it beneficial, in agreement with a similar proposal made by CIMO-XII, that valuable papers should additionally be published in scientific journals to guarantee access to a wider community in and outside of the NMHSs.

2.4 Co-operation with other commissions and programmes of WMO and bodies outside of WMO

The meeting has been informed that the co-operation with other WMO technical commissions as well as with bodies and organizations outside of WMO has been intensified. As already reported in Item 2.2. above, an intensive collaboration with 4 WMO technical commission has been carried out and CIMO experts could reply to requests received in a timely manner.

The support given by CIMO experts to SC 5 "Meteorology" of TC 146 of the International Organization for Standardization (ISO) for developing of standards has been continued and will soon lead to the issue of a first ISO Standard related to test methods for the determination of the performance of radiation shields, such a thermometer screens. The AWG was informed that WMO is now in the process of establishing a close collaboration with the International Bureau of Weights and Measures (Bureau International des Poids et Mesures - BIPM) which will led to an Agreement on Collaboration. It has the potential to bring in this new community with expertise in traceability and accreditation, which will benefit all WMO Programmes.
The meeting was pleased to note that the Association of Hydro Meteorological Equipment Industry (HMEI) was established in September 2001. HMEI intends to submit the related document to the forthcoming EC-LIV for getting a consultative status in WMO to be able to attend as observer sessions of WMO constituent bodies. It has been informed that its next meeting is planned to be held at TECO-2002. The AWG looked forward to a very active collaboration with the HMEI, which was expected to prove beneficial for both WMO and the industry.

3 REVIEW AND FOLLOW-UP TO DECISIONS OF CIMO-XII, Cg-XIII, ECs AND REGIONAL ASSOCIATIONS

The president reported on decisions of the thirteenth Congress as well as from the most recent sessions of the Executive Council, which are specifically addressed to CIMO or are relevant to CIMO’s work. Regional Associations didn’t make any additional requests. Attention has been given to the following matters of concern:

- Congress Cg-XIII (1999) requested in its Resolution 4 - *Instruments and Methods of Observation Programme* the president of CIMO to study and develop guidance on siting and exposure of instruments operated in urban areas. Following this, the president of CIMO nominated Professor T. Oke, Canada, and Mr R.D. Vashistha, India, as Co-rapporteurs on Urban Meteorology with the main task to draft a new Chapter for the *CIMO Guide* which should provide the required information.

- It also invited CIMO "to study the requirement of operating equipment, in particular automated weather stations, under harsh environmental conditions and develop guidance material for use by Members and manufacturers" as well as "to develop guidance material on the maintenance of equipment, especially of Automatic Weather Stations (AWSs)". The president of CIMO requested the chairman of the Working Group on Surface Measurements to consider these issues.

- The Executive Council EC-LIII (2001) reflected in Section 3.2.7 of its report the following: "In view of the growing importance of Automatic Weather Stations (AWSs) in several WMO Programmes, the Council requested CIMO to develop technical guidance material on standards, application and maintenance for AWSs." The president of CIMO transferred this task also to the chairman of the Working Group on Surface Measurements since it is strongly related to the above given request of Cg-XIII.

- Furthermore, EC-LIII (2001) addressed in Section 3.2.5 of its report the following request to CIMO: "The Council noted with satisfaction that CIMO continued its activities in further developing the role and functions of the Regional Instrument Centres (RICs). Plans are being developed to enhance the services of the RICs to support better the NMHSs in their regions through arrangements for providing advice on technical specifications, procurement, maintenance and repair of observing systems, and the adaptation of some RICs in developing regions into a home base for roving instrument repair teams. The Council invited CIMO to develop the necessary input to capacity building projects for such enhancements of RICs. It was expected that these activities would in the future contribute effectively to the rehabilitation and reliable operation of many observing stations in developing countries. However, the Council also noted in this context that several RICs were already today negatively affected in their work by the lack of resources. It, therefore, invited WMO Members as well as other interested bodies and institutions, to provide support".

The AWG considered this request in the light of the related discussions under Agenda Items 2.2.1 above and 5. below. They agreed that an actual review of the performance of RICs and their capabilities would be the suitable basis for any further action expanding the service of suitable Centres. The president of CIMO was invited to address a letter containing the necessary information and questions to the PRs of all 13 Members operating RICs for obtaining the required information (see Appendix D). Following the evaluation of the results, suggestions will be developed for consideration by CIMO-XIII on how best to proceed in tackling this matter of high importance as discussed further in Agenda Item 5.

The AWG was informed that the Meeting of Presidents of Technical Commission held in 2001 (2001-MPTCs) discussed the document of technical commissions entitled: "A Joint
Programme to Contribute to Natural Disaster Reduction in Coastal Lowlands submitted by the co-president of JCOMM. The result of a general discussion on the role of WMO, and specifically that of the WMO technical commissions, in the disaster reduction issue, was that the meeting recognized that WMO and NMHSs were and should be involved during virtually all phases of a disaster. Since one of the main duties of WMO and NMHSs in this connection was to produce and deliver, well in advance, accurate and reliable warnings; the role of technical commissions should be to assist in carrying out these main duties. Following this, the president of CIMO will be involved in providing proposal for assisting Members. The president invited the chairman of the Working Group on Surface Measurements to review available material and to present results at CIMO–XIII as well as to consider inclusion of additional necessary tasks to be undertaken by a relevant working group expert team established by CIMO-XIII.

4 AUTOMATION OF OBSERVATIONS, MAINTENANCE AND REPAIR OF EQUIPMENT, QUALITY CONTROL / ASSURANCE OF MEASUREMENTS

The AWG considered issues on maintenance, repair and calibration of sensors and equipment by NMHSs and briefly discussed measures for enhancing the quality control / assurance (QC/QA) of measurements especially required due to the increased application of automatic systems for surface and upper-air observations. It referred in this context to the challenging situation for guaranteeing reliable measurements of high quality in developing countries. Related to the latter, the important role of RICs was highlighted as reflected in item 2.2.1 and 5. of the Agenda. It felt that work accomplished by the Working Groups on Surface Measurements as well as on Ground-based Upper-air Observing Systems already covered large parts of this matter of serious concern in developing proposals on how to proceed best in this area; while further efforts will be undertaken to further tackle this task. In addition, it highlighted the value of maintenance contracts between users and instrument providers as an important means for widely guaranteeing the functionality and quality of observations.

5 CAPACITY BUILDING, EDUCATION AND TRAINING, AND THE ROLE AND FUNCTIONS OF RICs

The AWG considered further steps towards an enhancement of measures related to capacity building especially in developing countries, based on the report given and the proposals developed by the Co-rapporteurs on Capacity Building (see Agenda Item 2.2 above) as well as on the results of the Expert Meeting on Capacity Building related to Instruments and Methods of Observation (Beijing, China, September 1999). It also considered the work of RICs and collaboration between RICs, as well as activities necessary for improving education and training of instrument experts, such as through Web-based training. The role and functions of RICs were reviewed according to their terms of reference. The responsibilities and related activities of the Regions concerned were considered. The AWG take note of the proposals contained in document Doc. 5 for certification of the performance of RICs and discussed the issue related to the RICs and their functioning.

The AWG noted, as discussed in Agenda item 3, that EC-LIII (2001) requested additional functionality for RICs, such as “arrangements for providing advice on technical specifications, procurement, maintenance and repair of observing systems, and the adaptation of some RICs in developing regions into a home base for roving instrument repair teams”.

Noting that the concept of RICs was widely appreciated within WMO, there was nevertheless concern that the large difference in their capabilities of the 13 existing centres and the difference in regional or sub-regional requirements rendered the impacts of the centres not as effective as they should have been. In particular, their role in meeting agreed capacity building objectives, e.g. education and training using modern tools, a technical library on instruments practices, procedures and standards, and assistance to countries’ observing networks, has not been possible for many centres. The AWG underlined in this context the need for a good collaboration between RICs, especially those established within the same Region, and noted with appreciation the good collaboration already established between the RICs of Japan and China.

See also Agenda Item 5. below.

2 The Final Report of the Expert Meeting is accessible through the WMO/CIMO Web-Site.
The AWG recognized that the need for establishing these centres and the functionality of such centres might vary between and across Regions. Individual Regions may require more than one Centre. It was also considered more economical to plan for one or two specific centres that specialise in a particular instrument group and take on cross-regional responsibilities for providing support, than attributing responsibility for the full spectrum of instruments into each individual centre. The option of virtual centres created by networking existing RICs was also recommended for consideration.

The AWG underlined the continued importance of the role of the RICs in capacity building and recommended a new approach for setting up and implementing RICs. As already briefly referred to under 2.2.1 above and if funds /savings may still be available, it might be considered by the Secretariat in close collaboration with the president of CIMO to invite the heads of RICs to participate TECO-2002 or / and CIMO-XIII, maybe as representatives of the Regions concerned, with the objective to convene a side-meeting to continue the discussion, as started at CIMO-XII. In the light of the urgent need for enhancing the collaboration within the Regions concerned and beyond as well as considering the increased and new requirements.

A sub-committee of the AWG was identified, composed by Prof. XU, Dr Nash and Mr Belhouji, chaired by Dr Canterford, to refine and complete the suggestions as given below by the end of February for consideration at CIMO-XIII related to the enhancing the performance and service of RICs as well as to cope with new requirements. This approach will include the following principles:

- All RICs should demonstrate their capabilities and performance to the Regional Association concerned according to the requirements established by resolution or to constituent body, preferably CIMO.

- RICs should be based on the stated requirements of the Region and shall annually submit reports to the presidents of the RA concerned, preferably copied to the president of CIMO, that should reflect the activities of the previous year and contain information the action programme for the following year.

- RICs that may have additional capabilities than fixed within the agreed terms of reference may consider to assist in the implementation of Members' request for providing advice on technical specifications, procurement, maintenance and repair of observing systems, and the adaptation of some RICs in developing regions into a home base for roving instrument repair teams.\(^3\)

- For more synergy and for facilitating the exchange of information as well as the collaboration between RICs and better informing Members, it is proposed to publish information on their performance, services and plans for activities through the WMO / CIMO Web Site.

The AWG underlined the importance of the Instrument Catalogue for provision of relevant information of instruments and providers to meteorological community, especially for facilitating the procurement process of equipment. It thanked CMA China for establishing the Catalogue in CD-ROM format and for taking care on its update. In highlighting the good structure to facilitate the selection of the required equipment, it drew attention to some minor deficiency, namely the application of the Microsoft Personal Web-Server (PWS), which could conflicted with other Web-Servers applied in some Services. It was proposed that another principle should be used for the next updated version (such as HTML of pdf-format) than the PWS to prevent any conflict. The president of CIMO will reply to a relevant request of the PR of China.

6 UPDATES AND SUPPLEMENTS NECESSARY IN THE CIMO GUIDE

The AWG has been informed on the status of the review of the chapters of the CIMO Guide (WMO-No. 8, sixth edition, 1996), carried out by Mr R. Thomas, former member of the AWG, by the working groups and the rapporteurs concerned. It noted with appreciation that several proposals for its update have been received as well that a significantly updated version of the part related to AMDAR, as contained in Chapter 3 of Part I, was already drafted. Furthermore, it noted with interest that two new Chapters on “Urban and Road Meteorology” for implementation in Part II are still in preparation by the Co-rapporteurs responsible for these fields. The session was pleased

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\(^3\) See request of EC-LIII, as referred to above.
to note that it is tentatively planned to employ a consultant for facilitating the updating of the CIMO Guide. The AWG discussed and agreed on procedures for approval of the new as well as of the significantly amended Chapters and considering how to proceed best with the publication of the edited and supplemented version, if possible still prior to CIMO-XIII. It proposed that Mr Dombrowsky, supported by the chairmen of the two working groups, by the related rapporteurs and some known CIMO experts, should coordinate in close collaboration with the WMO Secretariat the reviewing process towards the approval for publication by the president of CIMO. Since it will still take quite a long time in finalizing the updated version, and the dispatch of the supplements to Members (even in English only) according to the official WMO procedures, it agreed that, as far as possible, attempts should be undertaken within the Secretariat to make available, if possible still prior to CIMO-XIII, a preliminary reviewed and supplemented version in English only, published in CD-ROM format and accessible through the WMO / CIMO Web Site. This will guarantee that users will be able to take advantage of the latest information for information only until the final version will become available.

Furthermore, the AWG also discussed in this connection matters of CIMO's concern related to other WMO publications (see Doc. 6). As recommended by the Working Group on Surface Measurements, it referred, among others, to WMO-No. 188 “International Meteorological Tables”, issued in 1966, which contains fundamental information to which several WMO mandatory publications refers to. However, is out of print for many years and will need a significant update if it will be kept as a basic reference. The AWG agreed that the president of CIMO should bring it to the attention of the other presidents, especially the president of CAS, at the forthcoming MPTCs (scheduled to be held in February 2002) with the intention to develop a solution on how to proceed best.

In addition to this it was noted that WMO-No. 622 “Compendium of Lecture Notes on Meteorological Instruments for Training Class III and Class IV Meteorological Personnel - Volumes I and II”, authored by Dr D.A. Simidchiev and published in 1986, was in most parts out of date. Since an update seems to be impossible and considering that the CIMO Guide is a good source for training of instrument specialists it is proposed to be deleted from the list of WMO publication. The president of CIMO is invited to inform the WMO Secretariat on this proposal.

On request of the chairman of the Working Group on Surface Measurements, the session also referred to Volume II (Meteorological Service for International Air Navigation) of the Technical Regulations (WMO-No. 49), which is identical with Annex 3 with the Convention of ICAO. Attachment B of Volume II contains a table with Operationally Desirable And Currently Attainable Accuracy Of Measurement Or Observations with respect to a number of variables, to be measured for aeronautical purposes. Although this table is specific for the aeronautical user community, any inconsistency with Annex 1/B of the CIMO Guide ("Accuracy requirements and achievable accuracy") should be avoided. This matter will need further collaboration between CIMO, CAeM and CBS and might be brought to the attention of the presidents. It was agreed in this context that the collaboration with other commissions should be enhanced to bring in line and make consistent with the CIMO Guide, the various mandatory publications.

7 LONG-TERM PLANNING FOR IMOP

7.1 Monitoring and evaluation of the 5LTP for 2000 and 2001

The session learned that the Executive Council at its fifty-third session (EC-LIII) adopted Resolution 12 (EC-LIII), which requested the presidents of regional associations and of technical commissions as well as the Secretary-General to submit their independent monitoring and evaluation reports on the implementation of the 5LTP for the years 2000 and 2001. The AWG took note of these reports as contained in Doc. 7.1 and agreed on its contents as reproduced in Appendix E.

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4 It proposed that the significantly updated chapter on "AMDAR" will be reviewed by Mr Dombrowsky, while Drs Canterford and Nash agreed to serve as final editors. The new chapters on "Road Meteorology" and "Urban Meteorology" will be edited by R Dombrowsky while Dr van der Meulen agreed to take the lead on the final editing.
7.2 Input for the 6LTP

The AWG has been informed that the EC Working Group on Long-term Planning (EC-WGLTP) prepared a draft proposal for the 6LTP, following the guidance agreed upon by EC-LII. It contains a broad vision statement, outcomes, strategies and associated goals. The WMO Secretariat, in close collaboration with the president of CIMO, considered this matter and provided input to the EC-WGLTP. This was in turn considered by EC-LIII. As agreed by EC-LIII, the Secretary-General is preparing input to the 6LTP, including strategies, associated goals and key performance indicators. The sections of the input pertaining to the WWW and especially to IMOP have been discussed in depth at the session (see Doc. 7.2). Resulting from these considerations, the AWG proposed to insert under Purpose and Scope a new paragraph (new Section 6.1.29) which has been taken from the 5LTP (paragraph 6.1.32) to better reflect the strategic concept of IMOP. Some minor amendments have been proposed to be inserted in the following paragraph. The part related to IMOP is reproduced in Appendix F of this report for consideration by the EC-WGLTP.

8 FUTURE WORKING PROGRAMME AND STRUCTURE OF CIMO

Based on the experience obtained with the presently applied structure, taking into account recent developments in technologies and techniques, the significantly reduced availability of instrument experts for doing work for CIMO, as well as the commercialisation of Services, the AWG considered matters related towards the development of an improved structure of CIMO for better meeting the future needs. Mr D.C. Schiessl, D/WWW-B, briefed the session on ongoing structural changes in the work of other commissions, such as applied by CBS, JCOMM, CAS, CCI and their impact on the work. The following discussions related to the development of proposals towards for a new structure and the establishing of an improved working mechanism also included considerations on a shorter working cycle than 4 years, as presently feasible for CIMO, as well as considerations related to he expected increased budgetary constraints which may have a negative influence on properly handling the tasks of IMOP within the next financial period compared with the previous one. It was recognized that the previous approach of CIMO and that of other commissions in having established large closed working groups might not be advantageous to be continued. The great number of experts serving so far within the working groups was mainly caused by the required representation of experts from all Regions, from developed and developing countries, as well as representatives of other interested commissions. It has been agreed that the application of a structure with open groups and smaller expert teams, guided by programme co-ordinators, might be a better solution to tackle the tasks. It was noted with interest that the regular preparation of newsletters as done by CBS for transferring information to experts and receiving feedback from them is an already well approved mechanism for getting better work results without convening meetings. The AWG has been informed that the co-ordinators within CBS are members of the CBS Management Group (formerly called "AWG") and that they also attend the Commission sessions. This principle also gives the co-ordinators the opportunity to decide at which session of groups or teams he may personally participate.

According to the experience obtained so far by CBS with the new structure, it led to a much more lively mechanism especially for tackling actual tasks. In order to shorten the planning cycle, more power was given to the Management Group (or Management Committee). Not only the review of the programme achievements belongs to its tasks, it can also take decisions towards the establishment of expert teams as well as on changes in their membership. However, the involvement of representatives of Regions was not yet fully satisfactorily solved and needs further considerations. In any case, it has been realized, as requested by Congress, that representatives of Regions will attend CBS Commission sessions, which was considered as a very powerful means in implementing the decisions of CBS.

The AWG has been informed that CBS has set up Implementation / Coordination Teams (ICT) which also have as members representatives from the Regions. However, the latter was considered as an expensive undertaking due to the fact that such a Team will easily reach a membership of up to 16 experts which requires significant financial support. However, as soon as regional representation is visible, it may give more power to the programme for getting approved an increase in the budget to better cope with the needs. The concept of ICT seems to strengthen the programme and is also a challenge for Members to financially support participation of their
experts, to provide reasonable time and resources for handling the tasks allocated to the nominated experts.

In further discussing these matters of utmost importance for the future work of CIMO, the president expressed the opinion that a new set-up of the structure should be developed and implemented after CIMO-XIII for better using the human as well as financial resources available for the advantage of the Commission as well as for Members, especially in achieving more flexibility in the intersessional work. The Vice-president noted with appreciation the success achieved by CBS after introducing the new structure, but it has critically to be considered for application by CIMO. The establishment of a Management Group has been found beneficial by the session for obtaining a more powerful mechanism in supporting the president and being able to react more flexible to immediate needs within the intersessional period. Noting that it is becoming more difficult to find well recognized experts in the fields of CIMO's concern, it was recognized that within CIMO's working structure, the close collaboration with representatives of other commissions and programmes has to be considered as a very relevant mechanism for cross-programme coordination of the work. The president of CIMO could bring this essential matter, i.e. nomination and participation of representatives of other commissions in relevant meetings and the provision of the required financial support, as far as needed, to the attention of the annual MPTCs after CIMO XIII (if approved).

However, it was noted with interest that urgent requests received from others so far, could already successfully be tackled with the presently applied CIMO working group structure by using modern means of communication. Further to this, it has been highlighted that some work can more effectively be done by holding expert meetings for getting immediate progress, involving also experts working outside of the meteorological community, such as from manufacturers, while such meetings my only partly be funded by WMO. As already referred to above, the work of CIMO is, unfortunately, significantly suffering by the lack of recognized experts and, if some are available, they may not have sufficient time for doing the work properly. It was noted that this problem will not significantly be changed when introducing another structure. It was recognized that it is difficult to fit experts in very specialized fields within any established structure while also the presently applied working mechanism doesn’t meet these needs appropriately. Efforts might be undertaken to more involve higher level managers in the structure so that a delegation of tasks would provide a better guarantee for possibly getting better working results in more timely manner. It was agreed that more care has to be taken that the guidelines / regulations developed by CIMO should adequately be applied at least by all users within the Meteorological Community.

Within the discussion towards the development of a amended or new structure it was underlined that heads of any teams have to meet regularly or at least as required to co-ordinate their work appropriately to widely prevent duplication of efforts and work to be done by others. It was also highlighted that it is essential at any structural considerations to direct special attention to regional matters and to underline CIMO's responsibilities in the field of all operationally used instrumentation. CIMO has to defend its responsibility, especially in more intensively referring to its TOR.

Within the following discussion several matters of concern have been considered. This included, among others, also issues on how to realize in an acceptable manner regional participation and the involvement of experts from developing countries in the work of a possibly new structure of the Commission without again creating too large groups. An acceptable solution for this specific important issue could not be found yet. It was also considered that the new mechanism applied by CBS calls for shorter meetings and to hold meetings back to back to take most benefit of the limited budget available. Such arrangements calls for an excellent preparation well in advance of the planned events to take most benefit of them. Furthermore, the payment of lump sums could be another essential approach to use the limited budget effectively. It has also been underlined that it is possible convening meetings with a restricted membership according to the needs. Furthermore, the nomination of individual rapporteurs has seriously to be considered within the structural discussion.

Based on these considerations, the session developed a general proposal for a new structure, as reflected below. It established an ad-hoc committee, chaired by Dr Canterford supported by Dr Van der Meulen, Dr Nash and Mr Dombrowsky as members, to refine these suggestions at the
earliest convenience and to develop basic terms of reference for all groups. After consideration, review and confirmation by the president of CIMO, the proposal should be submitted as draft resolution for further consideration and approval by the forthcoming Commission session.

The following new structure of CIMO has been developed and proposed for further refinement:

**Management Committee or Group** (comparable with the former AWG)

and the following 4 specific groups:

- **Upper-air Observations** (or Instrument) **Technology Group**
  (or alternatively called Technical or Programme or System Area Group on Upper-air Measurement Techniques.)

- **Surface Observations Technology Group**

- **Requirements and Capacity Building Technology Group**

- **Standards and Quality Assurance Requirements Technology Group**

It has been agreed that these four groups, tentatively called in this Report Technology Groups, should be established as open groups, similarly as done by CBS, and with a core membership only. The terms of reference have to be well defined for these groups. Furthermore, it has been agreed, that as an initial attempt, each of them should be composed by 2 co-chairpersons only, while experts should be nominated for tackling the tasks according to the needs either by correspondence (preferably by E-mail), by establishing Task or Expert Teams with specifically allocated tasks, which can lead to meetings, or by convening expert meetings, since the latter was already very successfully applied in the past. Recognized experts have to be proposed for the various tasks by the co-chair to the president for confirmation, possibly in consultation with the members of the Management Committee. Support for experts' participation in meetings should, as far as possible, be given by Member countries. Since the discussion on the new working structure has to be continued under the leadership of Dr Canterford, in addition to the composition of the various groups and their terms of reference also matters related to the possible nomination of individual rapporteurs working in very specific areas, such as atmospheric composition, turbidity, ozone, etc. should be considered a.s.a.p. since these issues are already important when preparing the individual reports for submission to CIMO-XIII.

It has been agreed that these proposed Technology Groups have to collaborate closely under the supervision of the Management Committee. The tasking of the Technology Groups and individual experts, possible rapporteurs, has to be strengthened towards the result-oriented work. Deliverables have to be highlighted. The accommodation of representatives of CIMO within bodies of Regional Associations and of other technical commissions has still to be considered as well as their representation within the CIMO working structure to widely meet their needs. This also may include the possibly further increased involvement of experts from manufactures, taking advantage of the newly established Association of the Hydrometeorological Equipment Industry (HMEI) and the collaboration with organizations outside of WMO, such as ISO, BIPM, ITU, COST, EUMETNET, etc.

The AWG was invited to further develop and refine these proposals in close collaboration with the WMO Secretariat prior to its submission to CIMO-XIII. A draft document will be prepared by an Ad-hoc Group under the chairmanship of Dr Canterford, assisted by Dr Nash and Dr Van der Meulen, Mr Belhouji and Mr Dombrowsky, especially in developing the tasks / TOR and methods of operation of these groups. The major results should be contained in a resolution. In this context, the nomination of co-ordinators tackling the specific tasks within the groups as well as

5 Dr Nash was invited to refine the proposal according to the membership and, especially, terms of reference of this Technology Group.

6 Dr Van der Meulen was invited to refine the proposal according to the membership and, especially, terms of reference of this Technology Group.

7 Mr Belhouji was invited to refine the proposal according to the membership and, especially, terms of reference of this Technology Group.

8 Mr Dombrowsky was invited to refine the proposal according to the membership and, especially, terms of reference of this Technology Group.

9 This may also include considerations on a mechanism for updating the CIMO Guide.
possibly of independently working rapporteurs in very specific areas of CIMO's interest should also informally be considered.

The session learned that the WMO Secretariat will assist in close collaboration with the president of CIMO the development of this structure and prepare information on the proposed new working mechanism of CIMO which is intended to be dispatched to all Members and possibly also to CIMO members by a Circular Letter of the president of CIMO in due course prior to CIMO-XIII. The related letter addressed to the PRs will also contain the request of nomination of experts within the various fields of CIMO's concern, similarly as it has already successfully done in the past prior to the Commission sessions.

Provided CIMO-XIII will agree on a new working mechanism for the next intersessional period, it is proposed to consider convening an initial informal meeting of the newly established Management Committee immediately after the Commission session will be finished (such as still on Thursday evening (3 October) or on Friday, 4 October 2002) with the intention to further discuss, as far as possible, the impact of the new organizational structure to the work and how to organize best the activities in the intersessional period. This may also include a first attempt to define the fields in which the establishment of Expert Teams might be required as well as the development of proposals for the nomination of experts serving within in these Teams. The AWG session was aware that the organization of such a meeting is a challenging undertaking since experts serving as Co-chair of the Technology Groups will be nominated at the CIMO-XIII first and their stay in Bratislava can surely not easily be extended for another day without an earlier announcement.

9 PREPARATION OF CIMO-XIII AND TECO-2002

The meeting recalled that the thirteenth session of the Commission for Instruments and Methods of Observation (CIMO-XIII) is scheduled to be held in Bratislava, Slovakia, from 25 September (starting at noon) to 3 October 2002. It will be preceded by the technical conference TECO-2002, held from 23 to 25 September 2002 at noon which is accompanied by the traditional exhibition of meteorological and related equipment METEOREX-2002. The organizational preparation of CIMO-XIII and TECO-2002 will be done by the WMO Secretariat in close collaboration with the Slovak Hydrometeorological Institute (SHMU) while METEOREX-2002 will be organized by the host country. The AWG took note of the Tentative Work Plan for CIMO-XIII, TECO-2002 and METEOREX-2002 developed by the Secretariat (see Doc. 9(2)) and fully agreed upon this proposal. It is reproduced in Appendix G of this report.

9.1 Preparation of CIMO-XIII

Based on the results of the discussions at the AWG session related to the various items, the draft of the Provisional Agenda developed for CIMO-XIII, as contained in Doc. 9(1), has been considered. With the exception of very minor amendments, the session agreed upon the proposal submitted, as it can be found in Appendix H.

The session briefly considered the working arrangements required for the Commission session, including proposals for the nomination of experts serving as chairmen of working committees, the establishment of sub-committees and of ad hoc-groups at CIMO-XIII. Since these matters still need some further considerations, no firm decisions have been taken yet. Proposals for a refinement will be done by the WMO Secretariat in close collaboration with the president and vice-president of CIMO and, as far as needed, in consultation with the members of the AWG concerned.

The AWG took note that according to the General Regulations of WMO (see Basic Documents No. 1, WMO-No. 15, Regulation 188) "... the documents for the session shall be sent a.s.a.p., and preferably not later than 45 days before the opening of the session to members of the commission and ...". In considering that some significant time for the final editing of the submitted draft reports as well as for the translation into the official working languages has to be taken into account, it agreed that the chairmen of working groups (including the president) and the rapporteurs should submit their reports to the president of CIMO with a copy to the WMO Secretariat at the earliest convenience but not later than 15 April 2002. These reports should also contain Draft Recommendations, as discussed at the session of the working groups and the AWG, and Draft
Resolutions, as far as still needed due to the proposed new structure. In addition to this, the AWG was informed that, as usual, the total number of words for all documents to be submitted to CIMO should not exceed 60 000 words, which is a similar figure as it was permitted for CIMO-XII. This will lead, as usual, to a restriction of words for the individual documents to be prepared according to the Draft Agenda by the experts concerned which can roughly be summarized as follows, while a detailed adjustment will be done in due course by the Secretariat in consultation with the experts concerned:

Reports of the president of CIMO and of the chairmen of working groups\textsuperscript{10}: ........\approx 4000 \text{ words}

Reports of rapporteurs:.....................................................................................................................\textsuperscript{<2000} \text{ words}

It is recommended that the president, in consultation with the Secretariat, will inform the independently working rapporteurs on this schedule as well as on the limitation in the length of their contributions.

After having considered these limitations, it has been agreed that the preparation of publications within the WMO IOM Report series is essential to present, if appropriate, the partly substantial working results achieved within the intersessional period since only a brief summary can be accommodated in the documents for consideration at CIMO-XIII. Related proposals have already been discussed earlier at the meeting, based on the results of the working group sessions. These IOM publications, which are intended to be prepared in CD-ROM format and distributed to all CIMO members, will significantly support the scientific discussion at the Commission session. In considering the importance of these publications it was agreed that a thorough review should be done prior to their submission for publication by the chairmen concerned or by a designated member of the AWG. The manuscripts should be submitted in PC-readable format a.s.a.p. but not later than by the end of May to guarantee its timely publication and dispatch prior to COMO-XIII. If possible, they should also be put on WMO/CIMO's Web-Site. Related decisions on how to proceed with the preparation and the contents of these publications are reflected in greater detail within the Final Reports of the sessions of the 2 CIMO working groups.

1.2 Preparation of TECO-XIII

Related to the preparation of TECO-2002, the Advisory Working Group has been informed that an International Programme Committee (IPC) has been established by the president of CIMO for its preparation and running, chaired by Dr Canterford, Vice-president of CIMO and composed of Messrs J. Nash (UK), A. Belhouji (Morocco), A. Gusev (Russian Federation), J. Kruus (Canada) and as the representative of the host county I. Zahumensky (Slovakia). The IPC has already started its work in defining the Conference themes, as reproduced below:

Under the main conference theme

\textit{Progress in Meteorological Observing Technology}

the following main subjects will be addressed:

1. New developments, operational experience and results of intercomparisons in meteorological and environmental measuring technology, as well as data-processing methods and procedures related to automatic weather stations:
   - \textit{Surface measurements including sensors, automatic stations and systems for specific applications and requirements (e.g. resource management)};
   - \textit{Upper-air in situ measurements};
   - \textit{Surface-based remote sensing techniques};

2. Quality management, calibration technology and methodology for sensors, validation of surface-based remote sensing systems

3. Management and cost aspects related to instruments and observing methods; technology transfer; capacity building including training needs and opportunities

\textsuperscript{10} - A cover page for a document comprises \approx 200 \text{ words}

- One full page of text comprises \textsuperscript{<} 700 \text{ words}

- A resolution/recommendation comprises \approx 400 \text{ words}
4. Application of meteorological and environmental instruments in natural and renewable resource management

These themes may still need a modification or amendment depending on the papers available.

The IPC will continue its tasks related to selection of papers for presentation out of the already more than 160 received abstracts, taking into account that at the maximum only 35 papers can be accepted for oral presentation due to the very limited time available. The AWG has been informed by the chairman of the IPC that is planned to present 2 keynote/overview papers to be prepared and presented by Drs Srivastava, and Nash.

The AWG was informed that it is planned to provide simultaneous interpretation in English, French, Russian, and Spanish at TECO-2002.

1.3 Preparation of METEOREX-2002

The session has been informed that the preparation of the exhibition METEOREX-2002 is already underway by the host country. The WMO Secretariat provided a list with names and addresses of much more than 500 manufacturers and providers of meteorological, hydrological and related instruments and services to the focal person in the SHMU of the Slovak Republic. The related letter addressed to the potential exhibitors was in the process of dispatch. Furthermore, the organizers of the exhibition will create a Web-Site through which all essential information can be accessed.

10 ANY OTHER BUSINESS

10.1 In-depth report of the president to EC-LIV

The session briefly discussed the draft of the in-depth report of the president of CIMO to EC-LIV (as reproduced in Doc. 10.1) and agreed on its contents (see Appendix I). Further to this, the president invited all members of the AWG to provide pictures and other interesting contributions/illustrations for making his oral presentation at EC more attractive, reflecting the working results and the future plans of the Commission.

10.2 Certificate for Outstanding Services to CIMO

The AWG considered proposals for the nomination of recognized experts being awarded with the "CERTIFICATE FOR LONG AND OUTSTANDING SERVICE WITHIN THE COMMISSION". It has unanimously been agreed that there are 2 candidates for this award and invited the president to bring this to the attention of the WMO Secretariat.

11 CLOSURE OF THE SESSION

Dr Srivastava thanked the participants for their active work and their valuable contributions provided prior to and at the session. He also thanked the Secretariat for the substantial and accurate support provided.

Mr Schiessl thanked all experts for their lively discussions and the valuable contributions provided. On behalf of the participants, he especially thanked Dr Srivastava for his dedicated and engaging chairmanship. He underlined that substantial work still has to be done prior to the forthcoming session of CIMO. He finally wished the participants every success in their work as well as a safe and uneventful trip home.

The session was closed on Friday, 25 January 2002, at 4.30 p.m.

************
# LIST OF ATTENDANCE

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<tr>
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<td>1</td>
<td>Dr S.K. Srivastava</td>
<td>India</td>
<td>President of CIMO</td>
</tr>
<tr>
<td>2</td>
<td>Dr R.P. Canterford</td>
<td>Australia</td>
<td>Vice-president of CIMO</td>
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<tr>
<td>3</td>
<td>Dr J.P. van der Meulen</td>
<td>Netherlands</td>
<td>Chairman of the &quot;CIMO Surface WG&quot;</td>
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<tr>
<td>4</td>
<td>Dr J. Nash</td>
<td>UK</td>
<td>Chairman of the &quot;CIMO Upper-air WG&quot;</td>
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<tr>
<td>5</td>
<td>Mr A.I. Gusev</td>
<td>Russian Federation</td>
<td>Member and Vice-president of CBS</td>
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<td>6</td>
<td>Mr R. Dombrowsky</td>
<td>USA</td>
<td>Member</td>
</tr>
<tr>
<td>7</td>
<td>Prof. Baoxiang XU</td>
<td>China</td>
<td>Rapporteur on Capacity Building</td>
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<tr>
<td>8</td>
<td>Mr A. Belhouji</td>
<td>Morocco</td>
<td>Member</td>
</tr>
<tr>
<td>9</td>
<td>Mr D.C. Schiessl¹</td>
<td>WMO / WWW-B</td>
<td>Director</td>
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<tr>
<td>10</td>
<td>Dr A. Karpov¹</td>
<td>WMO / WWW-B</td>
<td>Acting Chief, OSY</td>
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<tr>
<td>11</td>
<td>Mr K. Schulze</td>
<td>WMO / WWW-B</td>
<td>SSO, OSY</td>
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¹ Part-time participation
APPENDIX B

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Fax: (+41 22) 7308 021 (direct)
E-mail: schulze@wmo.ch
(or Schulze_K@gateway.wmo.ch)
******

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# LIST OF DOCUMENTS

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Progress Report of the Co-rapporteurs on Urban Meteorology | T. Oke, Canada, R.D. Vashistha, India |
Progress Report of the Rapporteur on Atmospheric Ozone Measurements | V.M. Dorokhov, Russian Federation |
Progress Report of the Rapporteur on UV Measurements | B. McArthur, Canada |
| 7. | Doc 2.2(1) | 3. I. 2002 | Reports of the members of the AWG on the status of the work accomplished according to the allocated tasks, including the Co-rapporteurs on Capacity Building  
Report of the Co-rapporteurs on Capacity Building | Baoxiang XU, China |
| 8. | Doc 2.2(2) | 8. I. 2002 | Reports of the members of the AWG on the status of the work accomplished according to the allocated tasks, including the Co-rapporteurs on Capacity Building  
| 9. | Doc 2.2(3) | 15. I. 2002 | Reports of the members of the AWG on the status of the work accomplished according to the allocated tasks, including the Co-rapporteurs on Capacity Building  
Report of the chairman of the Working Group on Surface Measurements | J.P. Van der Meulen, Netherlands |
| 10. | Doc 2.3(1) | 15. I. 2002 | Reports on results of expert meetings, intercomparisons, workshops, information on publications, etc.  
Report of the chairman of the Working Group on Surface Measurements related to instrument intercomparisons | J.P. Van der Meulen, Netherlands |
| 11. | Doc 2.3(2) | 15. I. 2002 | Reports on results of expert meetings, intercomparisons, workshops, information on publications, etc.  
Report of the chairman of the Working Group on Surface Measurements related to expert meetings | J.P. Van der Meulen, Netherlands |

1 All documents can be made available on request addressed to Mr. K. Schulze, WMO (E-mail: schulze@wmo.ch)
<table>
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<td>Doc 10.1</td>
<td>10. I. 2002</td>
<td>In-depth report of the president of CIMO to EC-LIV</td>
<td>S.K. Srivastava, India (Pres. of CIMO)</td>
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***************
Subject: Review of the work undertaken by Regional Instrument Centres (RICs)¹
Action required: Returned the completed RIC review form(s) to the WMO Secretariat at the earliest convenience but not later than 15 April 2002
Annexes: 4

Dear Sir,

I am pleased that your WMO Regional Instrument Centre (RIC) is now one of 13 designated by Regional Associations. RICs are an essential component of the Instruments and Methods of Observation Programme (IMOP) that ensures the standardisation of measurements of environmental variables required for all Technical Commissions and Programmes of WMO.

The WMO Executive Council EC-LIII (Geneva, 2001) restated the essential work of RICs and proposed that CIMO investigate enhancement of their services. In order to satisfy this request of EC, CIMO must continue its ongoing review of progress in the activities of RICs against their Terms of Reference (TOR). I have included for your convenience a copy of the general TOR as Annex A, as reflected within the Guide to Meteorological Instruments and Methods of Observations (CIMO Guide), WMO-No. 8 (Sixth edition, 1996). Although the Associations might have amended these TOR very slightly, the given requirements are valid for all RICs.

At Annex B, I included a questionnaire containing the essential components, which has also been used in previous progress reviews of RICs. I request you to complete this questionnaire and send it for compilation to me with a copy to the Secretariat as soon as possible, but not later than 15 April 2002. To provide an overview on the results of the previous inquiry you will find attached for your information and consideration a table briefly summarizing the equipment available as well as a copy of the reply received from your Centre, if available (Annex C). In the case the reply has not yet been sent or the equipment or any other conditions have been changed or are deviated since then, you are kindly invited to also complete the slightly simplified questionnaire compared with the previous version from 1998 (as contained in Annex D), taking into account the questions already contained in the new Inquiry (see Annex B).

It is important that you provide the most accurate information possible, since the compiled replies will be presented at CIMO-XIII as the basis for discussions towards a decision on how to cope best with the increased needs.

Finally, I should like to thank you for your co-operation in operating a Regional Instrument Centre, and in advance for returning the completed attached important questionnaire(s).

Yours faithfully,

(S.K. Srivastava)

To: Heads of the RICs
cc: PRs of Members of WMO operating a RIC  Presidents of Regional Association  ) Without Annexes; for information only.

¹ Distributed by the WMO Secretariat
APPENDIX D, RIC-INQ, ANNEX A

REGIONAL INSTRUMENT CENTRES (RICs)
Information on the general terms of reference and the location of the RICs

The following text reflects the general terms of reference of Regional Instrument Centres (RICs) as recommended by CIMO-IX in 1985. This is the basis for the specific terms of reference refined and approved by the Regional Association concerned for the RICs established within their field of responsibility. The text reproduced below is excerpted from the sixth edition of the Guide to Meteorological instruments and Methods of Observation, WMO-No. 8 (1996), Part I, Chapter 1 "General", Annex 1.A.:

1. Considering the need for regular calibration and maintenance of meteorological instruments to meet the increasing needs for high quality meteorological and hydrological data, the requirements of Members for standardization of meteorological instruments, the need for international instrument comparisons and evaluations, and for training of instrument experts, it is recommended to establish Regional Instrument Centres.

2. Regional Instrument Centres are designated to carry out the following functions:
   (a) To keep a set of meteorological standard instruments linked with recognized international or national standards and to log their performance and elements of comparison;
   (b) To assist Members of the Region in calibrating their national standard meteorological instruments or in comparing them with the standard instruments mentioned in (c) below and to keep the Members of the Region and the WMO Secretariat informed on the available standard instruments;
   (c) To be prepared to certify the instruments' conformity with the standards with reference to WMO recommendations;
   (d) To organize instrument evaluations and comparisons, following standard methods;
   (e) To advise Members of the Region concerned on their enquiries regarding instrument performance and the availability of relevant guidance material;
   (f) To assist WMO in organizing regional symposia, seminars or workshops on the maintenance, calibration and comparison of meteorological instruments by providing laboratory and field installations, as well as assistance with regard to demonstration equipment and expert advice;
   (g) To keep a library of books and periodicals on instrument theory and practices;
   (h) To cooperate with other Regional Instrument Centres to provide standardization of meteorological instruments.

3. The following Regional Instrument Centres have been designated by the Regional Associations concerned:
   Seddika-Oran (Algeria), Cairo (Egypt), Nairobi (Kenya), and Gaborone (Botswana)  RA I
   Beijing (China) and Tsukuba (Japan)  RA II
   Buenos Aires (Argentina)  RA III
   Barbados, Costa Rica, and United States  RA IV
   Manila (Philippines) and Melbourne (Australia)  RA V
   Trappes (France)  RA VI

********************

1 The RICs of RA V are not yet contained within the CIMO-Guide, sixth edition, it will be supplemented soon.
APPENDIX D, RIC-INQ, ANNEX B

WORLD METEOROLOGICAL ORGANIZATION

QUESTIONNAIRE No. 4
on
Regional Instrument Centres (RICs)

1. IDENTIFICATION

1.1 Member country: ................................................................. WMO Region: ........

1.2 Regional Instrument Centre (RIC):

Title, first name and surname of the Director / Chief / Head of the RIC ¹
Dr, Ms, Mr ² ................................................................. / .................................................................
(Family Name) (First Name)

Postal Address of the RIC:
...............................................................................................................................................
...............................................................................................................................................
...............................................................................................................................................
...............................................................................................................................................

1.3 Telecommunication links:

Telephone: ...................................................... E-mail: .....................................................
Telefax: .......................................................

2. PROGRAMME AND FUNCTIONS

Considering the purpose for the establishment of Regional Instrument Centres (RICs), please answer the following questions, necessary to CIMO's continuing evaluation of progress of each individual RIC.

2.1 Report on individual RIC functions for the period 2000-2001 ³

2.1.1 Are your meteorological standard instruments linked to international or national standards?

International ❑ National ❑

2.1.2 Have you documented the performance of your standards as compared to the standard to which linked?

Yes ❑ No ❑

2.1.3 To what level has your RIC assisted Members of the Region falling in your responsibility ⁴ in calibrating their instruments with the standard instruments available at your centre?

Have not yet started the process ❑
Less than half of the regional membership ❑
More than half of the regional membership ❑
Completed the process ❑

¹ Please delete the inappropriate.
² Please delete the inappropriate.
³ Please tick "❑" the appropriate box.
⁴ May need specific considerations in Regions with more than one RICs, i.e. depending on the agreement in shearing the work.
APPENDIX D, RIC-INQ, ANNEX B, p. 2

2.1.4 Have you established a standards certification process?

- Yes ☐
- No ☐

2.1.5 Have you established an instrument evaluation and comparison following WMO standard methods?

- Yes ☐
- No ☐

2.1.6 How frequently do you advise Members of the region falling in your responsibility (see also 2.2 below\(^5\)) regarding instrument performance and the availability of relevant guidance material?

- As needed ☐
- Each month ☐
- Each quarter ☐
- Semi-annually ☐
- Annually ☐
- NOT YET DONE ☐

2.1.7 How often have you conducted regional symposia, seminars or workshops on instrument maintenance, calibration and comparison of meteorological instruments?\(^6\)

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<td>Technical visits</td>
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2.1.8 Does your centre maintain a library of books and periodicals on instrument theory and practices?

- Yes ☐
- No ☐

If the answer is "Yes", how do you describe your library?

- Small in size ☐
- Moderate in size ☐
- Comprehensive ☐

2.2 Collaboration with other RICs within the Region or beyond

2.2.1 Do you collaborate with other RICs?

- Within the Region\(^7\) Yes ☐
- No ☐

- Within RICs of other Regions Yes ☐
- No ☐

If the answer is "Yes", how would you describe your collaborative exchanges?

- Limited contacts less than twice per year ☐
- Moderate 2-5 contacts per year ☐
- Frequent more that 5 contacts per year ☐

\(^5\) Valid for Regions with more than one RICs, i.e. depending on the agreement in shearing the work.

\(^6\) Please tick " • " the appropriate box or, as appropriate, insert the number.

\(^7\) To be replied as appropriate.
3. STAFF AVAILABLE AT YOUR RIC

3.1 Technical staff

Number of experts: ....................................
Specify as far as possible: ..................................................................................................
............................................................................................................................................

3.2 Lecturers and trainers

Number of experts: ....................................
Specify as far as possible: ..................................................................................................
............................................................................................................................................

3.3 PRIMARY CONTACT PERSON FOR YOUR RIC

3.3.1 Technical / Scientific Manager

Name: Dr, Ms, Mr8 ........................................................ / ..................................................
(Family Name) (First Name)
Position: ..............................................................................................................................
Phone: ..............................................................
Fax: ..............................................................
E-mail: ..............................................................

3.4 Resource Manager

Name: Dr, Ms, Mr ........................................................ / ..................................................
(Family Name) (First Name)
Position: ..............................................................................................................................
Phone: ..............................................................
Fax: ..............................................................
E-mail: ..............................................................

4. GENERAL COMMENTS OR QUESTIONS (such as deficiencies, required assistance, etc.)9

......................................................................................................................................................
......................................................................................................................................................
......................................................................................................................................................

Date: .............................................................. (Signature)

Please return the completed questionnaire at your earliest convenience but not later than
15 April 2002 to:

World Meteorological Organization
World Weather Watch, Basic Systems Department
P.O. Box 2300
CH-1211 Geneva 2
Switzerland
Fax: (+41 22) 7308 021

8 Please, delete the inappropriate.
9 If space is not sufficient, please attach an additional page.
## RICs
### Analysis of the questionnaire
(as of 29 March 1998/Updated 10/98)

### Standards

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<td>(Yes)</td>
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### Remarks

With:
- **P**: Primary Standard Device
- **S**: Secondary Standard Device
- **O**: Other Type of Device
- **(P)**: There is some doubt whether these standards can be considered as "Primary Standard Device" according to the definitions of the CIMO Guide (based on ISO)

---

1 Newly established in 1998 at XII-RA V
QUESTIONNAIRE No. 3
on
Regional Instrument Centres (RICs)

1. IDENTIFICATION

1.1 Member country: ............................................................... WMO Region: ........

1.2 Regional Instrument Centre (RIC):
   Title, first name and surname of the Director / Chief / Head of the RIC
   Dr, Ms, Mr
   (Family Name) (First Name)

   Postal Address of the RIC:
   ............................................................................................................................................
   ............................................................................................................................................
   ............................................................................................................................................
   ............................................................................................................................................

1.3 Telecommunication links:
   Telephone: ............................................................... E-mail: ...............................................................
   Telefax: .................................................................................

2. FACILITIES / EQUIPMENT AVAILABLE

Please indicate below by checking the appropriate boxes which standard instruments are available at the RIC:

2.1 Temperature
   Type of standard:
   Primary ☐ Secondary ☐ Others ☐
   Type: ........................................... Manufacturer: .................................................................
   Range: ........................................... Uncertainty:
   Other useful information:
   ............................................................................................................................................
   ............................................................................................................................................
   ............................................................................................................................................
   ............................................................................................................................................
   ............................................................................................................................................

1 Simplified version of a similar inquiry as distributed early in 1998 to all at that time existing RICs
2 Needs to accomplished only if not yet completed and returned in 1998 or if there are deviations in the equipment used since then (see also Summary Table as contained in Annex C of this letter, especially if uncertainties are highlighted, such as by (P)).
3 Please delete the inappropriate.
4 Please delete the inappropriate.
5 Please use an additional sheet to add information you wish to share.
6 Please tick the appropriate box
7 See Guide to Meteorological Instruments and Methods of Observation (WMO-No. 8), sixth edition, especially Chapter 1.5.1 and the other relevant chapters of Part I
8 Formerly called "Accuracy"
2.2 **Humidity**

Type of standard: Primary ☐ Secondary ☐ Others ☐

2.2.1 Type: ................................ . Manufacturer: .................................................................... .......

2.2.2 Range: ................................ . Uncertainty: ............................................................... ..........

2.2.3 Other useful information: ................................................................................................ ...........

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2.3 **Atmospheric Pressure**

Type of standard: Primary ☐ Secondary ☐ Others ☐

2.3.1 Type: ................................ . Manufacturer: .................................................................... .......

2.3.2 Range: ................................ . Uncertainty: ............................................................... ..........

2.3.3 Other useful information: ................................................................................................ ...........

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2.4 **Solar Radiation**

Type of standard: Primary ☐ Secondary ☐ Others ☐

2.4.1 Type: ................................ . Manufacturer: .................................................................... .......

2.4.2 Range: ................................ . Uncertainty: ............................................................... ..........

2.4.3 Other useful information: ................................................................................................ ...........

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2.5 **Wind speed**

Type of standard: Primary ☐ Secondary ☐ Others ☐

2.5.1 Type: ................................ . Manufacturer: .................................................................... .......

2.5.2 Range: ................................ . Uncertainty: ............................................................... ..........

2.5.3 Other useful information: ................................................................................................ ...........

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2.6 Any other standards used

Type of standard:  
- Primary □
- Secondary □
- Others □

2.6.1 Type: ................................ . Manufacturer: .................................................................

2.6.2 Range: ................................ . Uncertainty: .................................................................

2.6.3 Other useful information: ...........................................................................................................
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Date: .......................................................... .......................................................... (Signature)

Please return the completed questionnaire at your earliest convenience but not later than 15 April 2002 to:

World Meteorological Organization  
World Weather Watch, Basic Systems Department  
P.O. Box 2300  
CH-1211 Geneva 2  
Switzerland  
Fax: (+41 22) 7308 021

5) Insert the variable and give some specifications according to the above structure.
APPENDIX E

Monitoring and evaluation of the Fifth Long-term Plan (5LTP)
(2000 - 2009)
for the years 2000 and 2001

6.1 The World Weather Watch (WWW) Programme

6.1.6 Instruments and Methods of Observation Programme (IMOP)

Main Results 2000-2001

Quality and reliability of instruments have been improved through calibrations and intercomparisons, in particular for GPS-based radiosondes, rain gages and pyrheliometers; the technology transfer to developing countries and their capabilities in the instrument sector have been strengthened through a variety of activities; the technical conference TECO-2000 held together with the exhibition METEOREX-2000 in Beijing, China, was well received as important events for the exchange of information and technology transfer; an extensive publication programme was key in spreading the working results to the instrument experts; a "WMO Instrument Catalogue" on CD-ROM was compiled and published; the establishment of an "Association of the Hydro Meteorological Equipment Industry" was successfully promoted in order to enhance the collaboration between WMO and the commercial instrument sector; proposals on requirements and definitions related to observing techniques and instrument standards, functional specifications for automatic weather stations and rain intensity measurements were developed and submitted to CIMO-XIII; according to the request of Congress addressed to the president of CIMO to study and develop guidance on siting and exposure of instruments operated in urban areas, Co-rapporteurs have been nominated with the main task to develop a new chapter for the CIMO Guide covering this area of high importance; interdisciplinary issues were supported through close collaboration with other technical commissions and bodies outside WMO, such as ISO and BIPM, including a draft formal working agreement between WMO and latter; guidance was provided to interested NMHSs to help them develop their germane instrument manufacturing facilities, and for organising coordinated procurement of instruments and consumables.

Evaluation:

The IMOP is the only programme in WMO that addresses quality, reliability and standards for meteorological and related environmental instruments and provides thus an important service to the WMO community and beyond to the equipment industry. Capacity building was priority, although limited financial resources and departure of the programme officer restrained activities and curtailed the programme output. In particular, the planned strengthening of the role of the Regional Instrument Centres, the financial support to the TECO/METEOREX events, and the training of instrument technician at regional level is far from adequate suffered from this situation.

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APPENDIX F
Sixth Long-term Plan
2004 - 2012

Excerpt
Chapter 6
WMO PROGRAMMES

6.1 The World Weather Watch (WWW) Programme

Purpose and scope

6.1.1 The World Weather Watch (WWW) Programme facilitates the development, operation and enhancement of world-wide systems for observing and exchanging meteorological and related observations, and for the generation and dissemination of analyses and forecast products, as well as severe weather advisories and warnings, and related operational information. The activities carried out under this programme collectively ensure that the NMHS of each Member has access to the information it needs to contribute effective services towards improving protection of life and property, increasing safety on land, at sea and in the air, enhancing quality of life, sustaining economic growth and protecting the environment. The WWW is organized as an international cooperative programme, under which the infrastructure, systems and facilities needed for the provision of these services are owned, implemented and operated by the Member countries. This is based on the fundamental understanding that the weather patterns do not recognise national boundaries and are always interactive, and that international cooperation is paramount, as no one country can be fully self-sufficient in the provision of all of its meteorological and related services.

6.1.2 The Programme's main functions are planning, organisation and coordination of the facilities, procedures and arrangements at the global and regional levels, related to the design of observing and communications networks, the standardization of observing and measuring techniques, the use of data management principles, and the presentation of the information in a form and format that is understood by all, regardless of language. In exercising all these functions, the WWW Programme relies upon and makes use of relevant scientific and technological advances.

6.1.3 The WWW basic infrastructure comprises thousands of observing stations on land, at sea, in the air, and several environmental geostationary and orbiting satellites; telecommunication networks and facilities for the rapid collection and exchange of observational data and forecast products; and meteorological centres for the generation of forecasts, advisories and warnings. Each Member country undertakes, according to its means, to meet certain responsibilities in the agreed globally cooperative scheme. The WWW is the key Programme of WMO to provide basic data, forecast products and services for other Programmes of WMO. It directly supports international programmes, such as GCOS, GOOS, IGOS, IGOSS and GAW.

6.1.4 One of the main goals will be the restructuring of the Global Observing System (GOS) into a composite system, particularly for upper-air observing based that will increase the use of ground-based remote sensing, AMDAR, satellites and Global Position System-Meteorology (GPS-MET). Meeting the requirements of monitoring the climate and the environment, in collaboration with partner organisations, will also be a GOS priority. Areas of emphasis in the implementation of GOS may differ in the individual countries, but cost-effectiveness, long-term sustainability and new collaborative arrangements among Members will be key elements in the future design and operation of the observing networks. This goal has its major impact on the implementation of Strategy 6 concerning observations of weather, water resources, climate and the related natural environment. It also makes substantial contribution to the Strategy 1 through providing the observational basis for production and delivery of increasingly accurate and reliable warnings of severe events. Enhanced observational capabilities of NMHSs will constitute the major prerequisite towards the implementation of Strategy 7. Finally, the restructured GOS will serve as an essential component for improving the effectiveness, efficiency and flexibility of structure and operations of WMO (Strategy 9).
6.1.5 Another main goal will be the further development of structure and operational principles of the GTS and its further evolution into the Future WMO Information System (FWIS). The GTS will respond to growing data communication needs of all WMO Programmes and exploit new technical and economic opportunities. Initially, the priority activity will be focused on achieving cost-effectiveness, enhanced data transmission capacity and a greater variety and flexibility of services. In a later phase, the upgraded GTS will evolve into the FWIS jointly supported by the GTS and WWWDM programme, and including input from other relevant programmes, such as AMP, AREP, GCOS, HWR and WCP. Similar to the first goal, this goal has its main impact on Strategy 6 in that part of this Strategy, which concerns maintenance and enhancement of systems for exchange data, products and information, and contributes to the implementation of Strategies 1 and 9. Improved communications will also make critically important contribution towards enabling the provision of increasingly beneficial services to public, governments and other customers as implied by Strategy 2.

6.1.6 The third main goal is the provision to all NMHSs of more specialized and increasingly reliable NWP products spanning forecast ranges from instantaneous to long-term and from local to global scale, improved early warning services for the mitigation of meteorological disasters and effective advice for emergency response to environmental catastrophes. This goal will make the main contributions to Strategy 6 in connection with the use of observational data for the preparation of operational forecast and warning services and related information. The main contributions will be made to the enhancement of the NMHSs capabilities (Strategy 7) and the improvement of the working mechanisms and practices of WMO (Strategy 9). Attaining this goal will support the delivery of warnings and the provision of services (Strategies 1 and 2). Provision of the information on the socio-economic benefits of understanding the weather, water, climate and related environment (Strategy 4) and the improvement of modelling of environmental processes (Strategy 5) will also be supported.

6.1.7 Members will enhance efforts to make operational systems and practices more cost-effective. This will be achieved through establishing and sustaining new flexible, composite, Earth- and space-based observing systems and adaptable networks for observing the conditions of the atmosphere/ocean system on a global scale. New strategies will be required to facilitate data availability and access so that the observing systems and programmes can be useful to operational meteorology and the research community for addressing the global environmental problems.

6.1.8 The WWW Programme will continue to put priority on capacity-building activities to avail of technological advances to enhance the WWW components, especially in developing countries, and on cost-effective, systematic monitoring and improvements to the operations of the WWW that can be derived thereof. It will thus endeavour after assisting NMHSs to fully participate in and obtain maximum benefits from the WWW system.

Overall objectives

6.1.9 The overall objectives of the World Weather Watch Programme are:

(a) To maintain and strengthen an efficient and economic world-wide integrated system for the generation, collection, processing and exchange of meteorological and related environmental observations, analyses, forecasts, advisories and warnings and other specialized products to meet the needs of all Members, WMO Programmes and relevant programmes of other international organisations;

(b) To promote and support, through capacity building, measures the introduction of standards, procedures and technology, which enable Members to contribute to, and benefit from, the WWW system and ensure the high level of quality, reliability and compatibility of observations and forecasts needed for the delivery of services required in Member countries;

(c) To provide the basic infrastructure for obtaining observational data and related services needed by relevant international programmes addressing global environmental issues.
Programme structure

6.1.10 The WWW comprises the design, implementation, operation and further development of the following three interconnected, and increasingly integrated, core components:

- Global Observing System (GOS), consisting of facilities and arrangements for making observations at stations on land and at sea, and from aircraft, meteorological satellites and other platforms;
- Global Telecommunication System (GTS), consisting of integrated networks of telecommunications facilities and services for the rapid, reliable collection and distribution of observational data and processed information;
- Global Data-processing System (GDPS), consisting of World, Regional/Specialized and National Meteorological Centres to provide processed data, analyses, and forecast products.

6.1.11 Coordination, integration and efficient operation of three core components are achieved through support programmes as follows:

- The WWW Data Management (WWWDM) programme monitors and manages the information flow within the WWW system to assure quality and timely availability of data and products and the use of standard representation formats, to meet the requirements of Members and other WMO programmes;
- The WWW System Support Activity (WWWSSA) programme provides specific technical guidance, training and implementation support, the WWW Operational Information Services, and supports cooperative initiatives.

6.1.12 In addition, the WWW Programme incorporates five programmes, which, while complementing and enhancing the core components of the WWW, provide significant input and support to other WMO Programmes:

- The Instruments and Methods of Observation Programme (IMOP) improves the accuracy and standardisation of instruments and observation/measurement techniques and promotes implementation new instrument technology;
- The WMO Satellite Activities (WMOSAT) programme coordinates the WMO requirements for environmental satellite data and products, facilitates cooperation between WMO and the satellite operators, and strengthens Members’ capabilities to receive and effectively use satellite data;
- The Tropical Cyclone Programme (TCP) assists Members in their efforts to mitigate tropical cyclone disasters and helps them to obtain the humanitarian, social and economic benefits of effective mitigation and to achieve sustainable development.
- The Emergency Response Activities (ERA) programme assists NMHSs to respond effectively to large-scale atmospheric pollution emergencies in close collaboration with other relevant international organisations;
- The WMO Antarctic Activities coordinate the WWW basic systems implementation and operation in Antarctica to meet the requirements for meteorological services as well as for environmental monitoring and climate research.

6.1.13 The WWW will be managed under the technical responsibility of the CBS, which covers the WWW component programmes GOS, GTS, and GDPS, the support programmes WWWDM and WWWSSA, as well as the technical elements of the space-based component of the GOS under the WMOSAT programme. The IMOP will be managed under the technical responsibility of CIMO. The TCP will be managed through regional associations and other regional bodies concerned.

Programme 1.1 - Global Observing System

..........
Programme 1.6 - Instruments and Methods of Observation Programme

Purpose and scope

6.1.29 The purpose of the Instruments and Methods of Observation Programme (IMOP) is to coordinate, standardize and advance technology, systems and methods for observing meteorological and related environmental variables to ensure the required availability and high quality of the relevant systems and techniques which are fundamental for all WMO Programmes. The Programme ensures publication of technical regulations and guidance material on observing practices and methods and performance characteristics of instruments.

6.1.30 The IMOP forwards procedures and technologies to observe the weather (Strategy 6) and the state of the atmosphere (Strategy 3) appropriate for all types of operational systems. The required uncertainties of measured data will be ensured by calibrations traceable to international standards, by intercomparing potential sensing technologies and by quality control procedures. The programme will stimulate capacity building related to the Programme, especially in supporting education and training up to the required level of technical expertise, which shall contribute to the enhancement of the NMHSs capabilities to deliver services (Strategy 7).

Main long-term objectives

The main long-term objectives of the Instruments and Methods of Observation Programme are:

(a) 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;

(b) To enhance the effective and economic use of observing technology/systems through training and technology transfer in developing countries and in close collaboration with manufacturers in exchanging technical information.

Implementation activities 2004 - 2007

Implementation components of the programme include:

(a) The development of methodologies and reference instruments to ensure the global availability of observations of high quality.

(b) Reviewing and developing guidance material and recommendations for instrument performance, observing methodology, data processing algorithms, calibration, installation, maintenance and quality assurance.

(c) Planning, coordinating and conducting instrument intercomparisons, calibrations and other trials in accordance with standardized procedures and publishing the results for use by Members and manufacturers.

(d) Monitoring and promoting calibration and validation activities of surface-and space-based remote sensing techniques.

(e) Enhancement of the quality and long-term stability of observations and measurements of meteorological and related environmental variables for operational applications and research by implementation of guidelines and recommendations provided by IMOP;

(f) Technology transfer and capacity building activities in the field of instruments and methods of observation through technical conferences and education and training.

In support of these activities, Members should carry out:

(a) Implementation of effective and economic observing/technology systems within the operational networks of the NMHSs;

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1 This paragraph has newly been inserted, unchanged taken from the 5LTP.
2 Sections a) to d) have newly been inserted while e) and f) are the former a) and b).
APPENDIX F, p. 5

(a) Enhancing capacity building activities of NMHSs, particularly those of developing countries, by improving the performance, or establishing as necessary, workshops for servicing and calibration of observing equipment;

(b) Improving education and training of technicians especially related to the field of maintaining modern meteorological equipment;

(c) Enhancing the performance of Regional Instrument Centres (RICs) by application of adequate equipment and well as by well educated experienced staff

(d) Provision of support to other NMHSs in the field of selection, implementation, operation and maintenance of adequate observing equipment.

The WMO bodies, particularly CIMO, should develop and support publication of guidelines for the use of modern methods of observations and cost-effective technologies to best meet the enhanced requirements. These bodies should also support capacity building activities by exchange of information and by technology transfer.

The Secretariat will coordinate and provide support to:

(a) Assistance to developing countries for the application of adequate cost-effective observing equipment;

(b) Training of technicians in the field of maintenance and repair of equipment needed for observations and measurements;

(c) Enhancing the performance of RICs within the fields of their responsibility;

(d) Transfer of technology and experience by the organization of technical conferences and workshops;

(e) Determination of the performance characteristics, especially of newly developed equipment, by carrying out field intercomparisons as well as the organization of calibration campaigns;

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APPENDIX G

TENTATIVE WORKING PLAN

for

CIMO-XIII conjointly held with TECO-2002 / METEOREX-2002

(Bratislava, Slovak Republic, 23 September - 3 October 2002)

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

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Explanatory notes:

Docs          Documents

WPs           Consideration of committee working papers.
PINKs         Consideration by plenary of "PINK" reports of the committees.

* General discussion and establishment of a sub-committee if necessary.

** With interpretation in the main 4 WMO languages.


METEOREX-2002 Exhibition of Meteorological Instruments, Equipment and Services.

***********************
PROVISIONAL AGENDA

1. OPENING OF THE SESSION

2. ORGANIZATION OF THE SESSION

   2.1 Consideration of the report on credentials
   2.2 Adoption of the agenda
   2.3 Establishment of committees
   2.4 Other organizational matters

3. REPORT BY THE PRESIDENT OF THE COMMISSION

4. SURFACE MEASUREMENTS

   4.1 Report of the Working Group on Surface Measurements
   4.2 Issues related to the automation of observations
   4.3 Instrument development
   4.4 Precipitation and evaporation measurements
   4.5 Meteorological radiation measurements
   4.6 Road meteorological observations
   4.7 Urban meteorological observations

5. UPPER-AIR MEASUREMENTS AND REMOTE SENSING

   5.1 Report of the Working Group on Ground-based Upper-air Observing Systems
   5.2 Radiosonde compatibility monitoring
   5.3 Calibration of satellite remote sounding systems
   5.4 GPS derived precipitable water content of the atmosphere
   5.5 Atmospheric turbidity measurements
   5.6 UV measurements
   5.7 Wind profilers
   5.8 Weather radar measurements

6. ENVIRONMENTAL MEASUREMENTS

   6.1 Atmospheric composition measurements
   6.2 Atmospheric ozone measurements

7. EDUCATION AND TRAINING, CAPACITY BUILDING, TECHNOLOGY TRANSFER AND MATTERS RELATED TO RICs

8. INSTRUMENT COMPARISONS

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

10. GUIDE TO METEOROLOGICAL INSTRUMENTS AND METHODS OF OBSERVATION

11. LONG-TERM PLANNING AND FUTURE WORK PROGRAMME OF THE COMMISSION

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1 It is expected to receive, among others, a paper from the president of CIMO on "Disaster Prevention"
12. COLLABORATION WITH OTHER WMO PROGRAMMES AND RELEVANT INTERNATIONAL ORGANIZATIONS

13. STRUCTURE OF THE COMMISSION FOR THE FUTURE WORK, ESTABLISHMENT OF GROUPS AND NOMINATION OF EXPERTS

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

15. ELECTION OF OFFICERS

16. DATE AND PLACE OF THE FORTEENTH SESSION

17. CLOSURE OF THE SESSION
3.2 Instruments and Methods of Observation Programme (IMOP); the in-depth report of the president of CIMO (agenda item 3.2)

3.2.1 The Executive Council noted with appreciation the in-depth report of the president of the Commission for Instruments and Methods of Observation (CIMO), Dr S.K. Srivastava (India). It was pleased with the progress made in the work programme of the Commission, the efforts to better co-ordinate regional instrument centres (RICs) as well as preparing and the holding instrument intercomparisons. The Council thanked all Members that supported the work of CIMO by making available experts and especially those that hosted RICs and instrument intercomparisons. The Council noted that the work performed under IMOP greatly benefits all Members and is particularly important in view of the increasing demands for accuracy, coverage, homogeneity and timeliness of observations by other commissions and programmes.

3.2.2 The Executive Council considered that much of the work planned for the intersessional period had been completed. It was pleased to note that the sixth edition of the Guide to Meteorological Instruments and Methods of Observation (WMO-No. 8, sixth edition) had been published in all languages and that an update, reflecting the progress achieved by the rapid development in techniques and technology, as well as containing supplementary Chapters informing on requirements in new fields of users’ interest was prepared and was close to its approval and publication. The Council also recognized the high value of the publications prepared by CIMO, containing the results of intercomparisons, specific studies, and status reports in fields covered by the IMOP, for achieving homogeneity and high quality in meteorological and related geophysical and environmental measurements.

3.2.3 The Executive Council was pleased to note that the WMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (TECO-2000), hosted by CMA China in Beijing in 2000, was of great success. Participants from 61 countries, which included 40 developing countries, had the opportunity to present and discuss the critical changes that are taking place in their work with instruments and methods of observation.

3.2.4 As requested by Cg-XIII, the Council expressed its appreciation that several activities have been initiated within IMOP to better involve manufacturers and suppliers of meteorological equipment in the work of CIMO. It noted with great satisfaction that the exhibition METEOREX-2000, held in conjunction with TECO-2000, was well receipted, especially that it had given the opportunity for a direct contact to exchange information and experience between instrument specialists as well as designers and producers of sensors and equipment. The Executive Council learned that further steps have been initiated towards an expansion of the fruitful cooperation between Member countries, the WMO Secretariat and manufacturers to better transfer the requirements and combine their expertise, because the constitutional meeting of the newly established Association of Hydro Meteorological Equipment Industry took place in 2001. This Association, being established and the legal instruments deposited, would serve as the body for the exchange of information between the private industry and WMO.

3.2.5 The Executive Council recognized the value of the Instrument Catalogue, which has been established according to the guidelines approved by CIMO, assembled by CMA, China, and distributed to all Members for facilitating their work in selecting the most suitable instruments for application within their operational networks. It has been informed that a regular update of this Catalogue, which is available in CD ROM format, is planned to be done by CMA, with the intention to finalize the next edition in 2002.

3.2.6 The Council noted with satisfaction the large degree of interaction between CIMO and other technical commissions and the responsiveness of Commission to the requirements expressed by them. It also noted with appreciation that CIMO offered its expertise to all other commissions and programmes at various occasions to make use of it. The Council noted with satisfaction that the close collaboration of CIMO with CBS in the field of radio frequency allocations for radiosondes and wind profilers has successfully been continued. It was also pleased to learn that CIMO, again
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in close collaboration with CBS, intensively dealt with the definition and implementation of the significantly enhanced requirements for automatic weather stations (AWSs) that newly occurred due to a substantially increased automation of national networks in replacing or supplementing human observers by AWSs. These activities specifically required the automatic generation of the former visual observations and measures for guaranteeing the data transmission had to be developed.

3.2.7 Furthermore, the Council had recognized that the long-term quality assurance of surface and specifically of upper-air data was considered by CIMO as one of the major fields of its work. It noted with interest that specific efforts were directed to the evaluation of the performance of GPS-based radiosonde types under tropical conditions, as done at the related WMO intercomparison carried out in Brazil in 2000. The Council was also briefed that the Ninth International Pyrheliometer Comparison (IPC-IX) which was successfully held in 2000 together with related comparisons of all Regions at the World Radiation Centre Davos, Switzerland, was the so far largest event carried out in this field. It noted with appreciation that the final report of the IPC-IX had been distributed so that the latest pyrheliometer calibration factors could already be applied within the national radiation networks. The Council then learned that further intercomparisons for determining the performance of sensors and equipment were in preparation, such as related to gauges suitable for rain intensity measurements, thermometer screens, hygrometers, etc. It urged Member countries to support these events by delivering equipment to be tested as well for provision of comparison sites including the required support by experts for running intercomparisons.

3.2.8 The Council recognized the important role CIMO is playing in collaboration with some international organizations and bodies outside of WMO, such as the International Organization for Standardization (ISO) and Bureau International des Poids et Mesures - BIPM. It welcomed the active participation of experts from some Members in the work ISO especially related to meteorological instruments, observing and calibration techniques. This collaboration lead already to the development of new ISO standards that were of great interest for the meteorological community world-wide. The Council was informed on efforts of the Secretariat towards a better coordination of the work between WMO and BIPM, aimed to lead to an Agreement for a closer cooperation intended to be elevated to a Working Arrangement. This would be beneficial for both organizations but especially useful for the work of CIMO, and hence other WMO Commissions.

3.2.5 As regards the activities of CIMO on capacity building in the field of instruments and methods of observation, the Council was pleased to note that an expert meeting was held on this important issue. However it expressed its serious concern that the actions initiated by the president of CIMO have not appropriately been responded by most of the Regions. It, therefore, agreed that these activities should intensively be continued and representatives from the Regions should be more involved. The Council regretted that training workshops for instrument specialists could not be held as planned mainly due to budgetary constraints. In underlining the importance of training for a securing an uninterrupted operation of instruments and the generation of data of high quality, it urged Members as well as the private industry to sponsor IMOP training events, support RICs and instrument intercomparisons, technical conferences as well as to make available experienced experts to participate in the challenging work of the various bodies of CIMO.