

Commission for Aeronautical Meteorology

Thirteenth session

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Abridged final report with resolutions and recommendations

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**World
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Weather • Climate • Water

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This report contains the text as adopted by Plenary and has been issued without formal editing.

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION (*agenda item 1*)

1.1 The thirteenth session of the Commission for Aeronautical Meteorology (CAeM) was opened at the WMO Headquarters Building, in Geneva (Switzerland), on 23 November 2006 at 10 a.m. by the president of the Commission, Mr Neil Gordon (New Zealand).

1.2 Mr Gordon welcomed the Secretary-General of WMO. He welcomed CAeM members and aviation user representatives and extended a warm welcome to new members. Mr Gordon thanked the members of the Commission for their work over the last four years and for preparing and submitting documents to this CAeM session. Mr Gordon pointed out that the large number of participants attending this session demonstrated how important aeronautical meteorology was to all Members of WMO as well as the matters that would be discussed. Mr Gordon said that the Commission would review progress made since the last Commission session held in Montreal in 2002, and most importantly would make plans for what the Commission should do to assist Members in providing services to aviation as well as how this would be achieved in terms of effective and efficient working mechanisms and structures for the next four years.

1.3 Mr Gordon welcomed the Secretary-General of WMO, Mr M. Jarraud. He thanked Mr Jarraud and his staff for their preparation of the session and invited him to address the session.

1.4 The Secretary-General, Mr M. Jarraud, welcomed the delegations and thanked them warmly for taking their valuable time to attend this important session. He gave a brief historical review of aviation, from its beginnings at Kitty Hawk beach to today's overcrowded airspace, and of aviation meteorology as part of the IMO, which later became WMO.

1.5 He went on to highlight the crucial problems that need to be addressed by aeronautical meteorology today:

- Training remained at the forefront of WMO's activities and concerns, and he cited the impressive number of events and participants benefiting from these over the intersessional period. All of these events were made possible by the generous support from host countries and international organizations such as ICAO and ASECNA;
- Mr Jarraud reminded the Commission also of the responsibility it had for ensuring that the impact of aviation on the environment was studied and remedial action, as far as possible, investigated using meteorological information on contrail and cirrus formation;
- He further stressed the importance of a recognized quality management system for aeronautical meteorology service provision as recommended by ICAO, and the need for support for Members in installing such systems;
- In referring to the Technical Conference held immediately preceding CAeM-XIII, he reiterated the overriding importance of maintaining excellent relations to the customers and stakeholders in the aviation sector by regular and detailed consultation processes.

1.6 In closing, Mr Jarraud wished the session excellent success, an agreeable stay in Geneva and safe travel home, expressing his confidence that aeronautical meteorology would contribute in no small measure to the safety of their trips.

2. ORGANIZATION OF THE SESSION (*agenda item 2*)

2.1 CONSIDERATION OF THE REPORT ON CREDENTIALS (*agenda item 2.1*)

In accordance with WMO General Regulation 22, a list of participants and the capacities in which they were attending the session was prepared on the basis of an examination

of the credentials. The list prepared by the representative of the Secretary-General (see [Appendix](#)), was accepted unanimously as the report on credentials. Consequently it was decided not to establish a Credentials Committee.

2.2 ADOPTION OF THE AGENDA (*agenda item 2.2*)

The Commission adopted the provisional agenda.

2.3 ESTABLISHMENT OF COMMITTEES (*agenda item 2.3*)

2.3.1 In accordance with WMO General Regulation 24, the Commission established the following committees for the duration of the session:

Plenary A and Plenary B

2.3.2 Two committees were established to examine in detail the various agenda items:

- (a) Plenary A to examine items 4.1 (OPAG TREND) and 5. Mr C. McLeod (Canada) was elected as chairperson of the Committee;
- (b) Plenary B to examine items 4.2 (OPAG PROMET) and 7. Mr C.M. Shun (Hong Kong, China) was elected as chairperson of the Committee.

Nomination Committee

2.3.3 A Nomination Committee was established consisting of the following delegates:

RA I	Mr Y. Boodhoo (Mauritius);
RA II	Mr Sang-Jo Kim (Republic of Korea);
RA III	Mr O. Bermudez G. (Columbia);
RA IV	Mr S. Baig (Trinidad and Tobago);
RA V	Mr G. Moynihan (Australia);
RA VI	Mr A. Polyakov (Russian Federation).

Mr Y. Boodhoo was elected as chairperson of the Nomination Committee.

Coordination Committee

2.3.4 In accordance with WMO General Regulation 28, a Coordination Committee was set up consisting of the president and vice-president of the Commission, the chairpersons of the Plenary A and Plenary B committees and the representative of the Secretary-General.

2.4 OTHER ORGANIZATIONAL MATTERS (*agenda item 2.4*)

2.4.1 The working hours were adopted from 9.30 a.m. to 12.30 p.m. and from 2.30 p.m. to 5.30 p.m.

2.4.2 The Commission decided that, in accordance with WMO General Regulation 111 and in view of the technical and specific nature of its discussions, it was not necessary to prepare minutes of the plenary meeting of the current session.

3. REPORT OF THE PRESIDENT OF THE COMMISSION (*agenda item 3*)

3.1 The Commission noted with appreciation the report of the president of CAeM, Mr Neil Gordon, and expressed its gratitude for his work on behalf of the Commission during his last term.

3.2 The Commission also thanked the Management Group (MG) for its work since CAeM-XII. It recognized that even in the face of limited resources there had been significant progress on items under the Sixth Long-term Plan, particularly in the area of training support and the establishment of the www.caem.wmo.int Website.

3.3 However, the Commission also recognized that it was important to focus on the essential roles that the Commission must play, in line with the available resources in terms of expert participation and available funding. It therefore welcomed the draft Operating Plan for 2008–2011 which had been formulated by the MG, intended as the basis of the work of the Commission for the next intersessional period, as well as the proposals for a more streamlined structure. The Plan and structure were intended to provide a focus on where the Commission and the Secretariat can add value in terms of assisting WMO Members in their own production of aeronautical meteorological services, and on working with other groups as much as possible rather than duplicating activities.

3.4 The Commission expressed its sincere appreciation to all those experts who had contributed, particularly since such work was often in addition to full-time in-country commitments, and expressed its wish for their contributions to be given due recognition by the experts' institutions.

3.5 The Commission strongly endorsed the Executive Council's request (*Abridged Final Report with Resolutions of the Fifty-eighth Session of the Executive Council* (WMO-No. 1007) general summary, paragraph 3.4.3.1) for the Secretary-General to endeavour to provide increased resources to the Aeronautical Meteorology Programme, which currently represented about 1 percent of the WMO budget, while aeronautical meteorology brought in as much as 30% of the budgets of many NMHSs. It also agreed on the importance of highlighting and promoting the role of NMHSs to ensure they were properly recognized for their operation of the basic system on which aeronautical meteorological services throughout the globe depended.

3.6 In particular, the Commission stressed that Cost Recovery had become a vital element in assuring the continued existence of many NMSs in developing countries and urged that Members should receive more support in establishing such schemes.

3.7 Noting the lack of funding for the Aeronautical Meteorology Programme in the current budget proposals, the Commission urged its members to promote the Aeronautical Meteorology Programme and to alert its national delegations at the forthcoming session of Fifteenth Congress to ensure adequate resources for these tasks.

3.8 The other issues raised in the report requiring actions and decisions were dealt with under the relevant agenda items.

4. REPORTS BY THE CO-CHAIRS OF OPEN PROGRAMME AREA GROUPS (OPAGs) (agenda item 4)

4.1 OPAG-TREND REPORTS (agenda item 4.1)

Expert Team on Education and Training

Expert Team on Improvements to Forecasts and Warnings in the Terminal Area

Expert Team on Quality Management

Expert Team on Performance Measurement

Rapporteur on Aviation and Global Environment

4.1.1 The Commission considered the report of Ms Sharon Lau (Hong Kong, China), the Co-chair of the CAeM OPAG on Training, the Environment and New Developments in Aeronautical Meteorology (TREND) and expressed appreciation for the activities carried out by the OPAG during the intersessional period.

4.1.2 The Commission noted with satisfaction that TREND had played a leading role in the establishment of qualification and training requirements of aeronautical meteorological personnel,

and the publication of Supplement No. 1, entitled *Training and Qualification Requirements for Aeronautical Meteorological Personnel* to the WMO-No. 258 *Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology* in collaboration with the WMO Expert Team on Accreditation and Certification in Meteorology Education and Training (ETAC).

4.1.3 The Commission commended TREND for the establishment of a dedicated Website (www.caem.wmo.int) making excellent training material available in electronic form, to backup the training process. Given the high quality and usefulness of the material on the site, the Commission encouraged Members to find ways of having this material translated into all WMO languages by experts in the NMSs thus ensuring world-wide penetration of the information.

4.1.4 While some training materials are now available on-line, the Commission was aware that the demand and need for training in aeronautical meteorology by far exceeded the very limited financial resources allocated for training activities in the regular budget of the Aeronautical Meteorology Programme and urged Members to help improve this situation through their generous financial assistance to the WMO Secretariat to organize training events or to conduct, in close collaboration with the WMO Secretariat, such events to be attended by participants from other countries.

4.1.5 The Commission recalled that the Conjoint WMO CAeM Session/ICAO Meteorology Divisional Meeting held in Montreal in 2002 formulated Recommendation 4/3 – Guidance Material on Quality Management Systems, subsequently endorsed by the ICAO and WMO Councils called on ICAO and WMO to develop a joint guidance material to assist ICAO Contracting States/WMO Members in the development of quality management systems for the provision of meteorological service for international air navigation. The Commission was pleased to note that the joint publication, “ICAO Manual/WMO Guide on Quality Management System for the provision of meteorological service for international air navigation”, was currently being published.

4.1.6 The Commission was informed that the WMO Quality Management Framework (QMF) and the implementation of ISO 9001:2000 should be complementary, not mutually exclusive activities. It could be more expensive to establish a WMO-own certification scheme due to permanent staff and travel costs and requirements for neutrality and geographic balance with WMO certification team. Furthermore, it was clear that a WMO-own certification scheme could not meet ICAO’s recommendation on QMS. The Commission was informed that an Intercommission Task Team (ICTT) on Quality Management Framework was set up to develop the WMO QMF. The Commission noted with satisfaction that the chair of the ET/QMS had attended the workshop in Kuala Lumpur in October 2004 on development of WMO QMF and the ICTT meeting in April 2006. The Commission was of the view that the supporting guidance documents should be streamlined and harmonized in close collaboration with other Commissions and ICAO. The Commission believed that the Technical Regulations could be reviewed with a view to improving their use to support quality management systems.

4.1.7 The Commission recalled that it entrusted TREND to pick up on the earlier work done on development of a user-oriented TAF verification scheme, to finalize it for easy adaptation to different hardware platform and database structure. The Commission was informed that due to limited resources, there had been limited progress in this area. The Commission was aware that the current TAF format, which had elements of both deterministic and probabilistic information, and rules for coding and change groups that did not necessarily match operational limits or the desirable accuracy as expressed by the users, had made it difficult for TAF to be verified in a standard or systematic way. The Commission was of the view that further studies, in collaboration with ICAO, the airline users and other stakeholders, should be conducted with a view to exploring possible new terminal weather forecasts that would better suit its purpose and the customer’s needs. As a general comment, the Commission noted the need to consider the comparability of verification results in different climates and weather situations.

4.1.8 The Commission noted with satisfaction that, in line with its terms of reference, TREND had been involved in a number of aviation-related environment activities in close cooperation with ICAO. In this regard, the Commission was pleased that the Rapporteur on Aviation and Global

Environment had attended the 6th CAEP and the Steering Group Meeting of CAEP in Montreal, Canada in February 2004 and in October 2005 and that CAEP Study Groups on Technology are addressing questions of airport ground transportation, taxiing with single engine, reverse thrust and other sources of NO_x in order to obtain a fuller picture of the overall emission situation. With regard to Greenhouse Gas Emissions and Climate Change the Rapporteur had drawn the attention of CAEP members to increasing evidence of the impact on radiative forcing by cirrus clouds that is favoured by contrail formation, and aerosols produced by aircraft exhaust gases.

4.1.9 The Commission noted with satisfaction that the Booklet on Aviation and the Global Environment prepared in collaboration with UNEP was jointly published by WMO and UNEP in March 2004. The future status of this document was pending the publication of the fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) Report, in which ICAO has requested a review of aviation-related findings.

4.1.10 The Commission was of the view that a clear position of WMO with regard to both local and global impact of aviation on the environment will be needed and that looking at the evidence of aviation impact of cirrus clouds and contrails remains a critical issue that should be addressed and supported by the Commission for Atmospheric Sciences and other WMO bodies in close collaboration with the IPCC Secretariat.

UK Met Office Climate Research Group findings on effects of aviation activities on global warming

4.1.11 The Commission appreciated being informed by the United Kingdom about the current work being done by the Met Office Hadley Centre for Climate Prediction and Research to investigate the effects of aviation activities on climate change. The results of this research indicate that aircraft emissions induce a net warming effect on the climate system. The reasons for this warming effect are summarized below:

- (a) The main emissions from aircraft which affect the climate system are carbon dioxide (CO₂), nitric oxide and nitrogen dioxide (which together are termed NO_x) and aircraft condensation trails (contrails);
- (b) Aviation is currently the fastest growing source of anthropogenic CO₂ emissions with aircraft usage increasing at around 3% per year. CO₂ contributes to the greenhouse effect, leading to a warming of the climate system. CO₂ has a long lifetime in the atmosphere hence today's CO₂ emissions are likely to directly effect the global climate system for much of the next century. For similar reasons, it will take several decades before any reductions in emissions will lead to a reduced rate of warming;
- (c) Nitric oxide and nitrogen dioxide (together termed NO_x) emissions lead to an increase in tropospheric ozone and a further warming of the atmosphere, however this is largely offset by a cooling effect due to NO_x reducing the concentration of methane;
- (d) Short-lived line contrails have little radiative effect on the climate system, however when they are long-lived and spread out to become thinner, they can induce a warming effect on the climate system. This effect is stronger at night when the greenhouse effect due to the contrail is not offset by any reflection of sunlight.

Future Aerodrome Forecasts

4.1.12 The Commission recognized that the current Aerodrome Forecast (TAF) was being used in many ways for which it had not been designed, and that forecast products more focussed on aviation decision-making were possible. Furthermore, there were difficulties in verifying forecasts expressed using the current TAF code.

4.1.13 The Commission agreed that the current state of the science of meteorology could not be fully exploited using the current TAF format and that the benefits of forecasting additional

parameters, such as runway visual range, runway surface condition and precipitation rate should be examined.

4.1.14 The Commission believed that probabilistic forecasts had the potential to be a valuable tool for increasing the safety and efficiency, and reducing the environmental impacts, of aviation operations. The Commission agreed that work on prototyping and investigation of the potential benefits of probabilistic forecasts enabling improved decision-making at aerodromes and in the terminal area should begin immediately. Such forecasts might supplement rather than fully replace the existing TAF. It would also be important to ensure that any new or modified products can be properly verified.

4.1.15 The Commission recognized that under the working arrangements between WMO and ICAO, ICAO had responsibility for defining user requirements and WMO had responsibility for how to meet those. Nonetheless, it was understood that development of new requirements and ways of meeting them in this area should be an iterative process in close collaboration between ICAO and WMO.

4.2 OPAG-PROMET REPORTS (*agenda item 4.2*)

Expert Team on Cost Recovery and Expert Team on Customer Focus

4.2.1 The Commission was pleased to note the report of the Co-chair of PROMET. The report, prepared by Ms M. Petrova (Russian Federation) and presented by Mr D. Lambergeon (France), highlighted the main achievements and progress of the two expert teams under her responsibility. The report also gave an account of the difficulties encountered in maintaining a sufficient number of active members of the teams, and the handicap in having to work mostly by correspondence.

4.2.2 The Commission appreciated the efforts of the Expert Team on Cost Recovery for the convening of several training seminars in cooperation with ICAO and the Secretariat. The Commission noted the participation of the president of CAeM in a cost-recovery workshop held in Tonga in December 2003, and of the Chair of the Expert Team on Cost-Recovery in a workshop held in Moscow, Russian Federation, in March 2006.

4.2.3 The Commission endorsed the close involvement of the ET with the Air Navigation Services Economics Panel (ANSEP) of ICAO, recognizing the importance of ICAO's support for the cost recovery process. The Commission further encouraged the ET to finalize the update of the *WMO Guide on Aeronautical Meteorological Cost Recovery* (WMO-No. 904). The Commission recommended that in completing the Guide, guidelines for benchmarking of the costs for service delivery by different organizational structures and clear guidelines for the choice of Performance Indicators should be included.

4.2.4 The importance of having training material based on actual case studies available on the www.caem.wmo.int Website was duly recognized by the Commission.

4.2.5 The Commission further agreed that continued efforts would be needed to organize and conduct training sessions and visits to Members in need of support and information in introducing cost recovery in their services.

4.2.6 On the question of cost attribution and efficiency, the Commission appreciated the work undertaken by the ET in comparing different methodologies applied by Members and suggested that such work would continue to be beneficial during the next intersessional period.

4.2.7 The Commission expressed appreciation on the work of the ET on Customer Focus and was informed that it had concentrated on the following high priority tasks:

- Encourage consultations at the national and regional level between major airlines, aviation representative bodies and service providers;

- Develop closer contacts with the aviation community by promoting cooperation with international bodies, including ASECNA, IATA, IFALPA, ATM and airport management;
- Identify best practices on the provision of services and consultation between providers and users and publish the examples.

4.2.8 In order to identify current best practices, the responses to a questionnaire sent out to 47 Members was analysed. This enabled the ET to select five Members services with different levels of air traffic density to develop case studies. These were the UK, France, Hong Kong, China, Belgium and Senegal. These studies are now available for reference on the www.caem.wmo.int Website.

4.2.9 Regarding outstanding issues, the Commission noted that the ET had identified the need to complete or continue the tasks outlined below:

- Ensure input from and cooperation with representatives from aeronautical administrations;
- Hold joint WMO/ICAO workshops on improvement of interactions with aviation users;
- Summarize methods for identification of future aviation users' needs in MET services;
- Consider performance indicators for aviation MET service providers.

Expert Team on Observations in the Terminal Area Expert Team on Operational Services

4.2.10 The Commission was pleased to note that the report of the Co-chair of PROMET, Mr Mike Edwards (South Africa) summarized the main achievements and progress of the two expert teams under his responsibility (Expert Team on Observations in the Terminal Area and Expert Team on Operational Services).

4.2.11 The Commission commended the OPAG Co-chair on the successful revision and publication of:

- *The Guide on Meteorological Observing and Information Distribution Systems for Aviation Weather Services* (WMO-No.731);
- *Aerodrome Reports and Forecasts, A Users Handbook to the Codes* (WMO-No. 782).

4.2.12 The Commission noted with satisfaction the close cooperation with the ICAO Aerodrome Meteorological Observing Systems Study Group (AMOSSG) on the subject of automated observations, providing input and comment to ICAO for its "Manual on Automatic Meteorological Observing Systems at Aerodromes", while realizing that care must be taken to avoid unnecessary duplication of work with this ICAO study group.

4.2.13 The Commission noted that excellent cooperation and coordination had guided the interactions of the ET with other WMO bodies such as CBS and the AMDAR panel.

4.2.14 The Commission recognized the need to maintain close liaison between CAeM and the WAFS Operations Group of ICAO, again with a view to avoid duplication of efforts.

4.2.15 The Commission was informed of continuing difficulties by some Members to produce locally SIGWX-Charts from BUFR-coded bulletins and noted with satisfaction that the WAFCs will continue to disseminate charts in .PNG format after the cessation of the T4 charts planned for 30 November 2006, until at least 2010 (WAFSOPSG/3, Conclusion 3/9 refers).

Rapporteur on the AMDAR Panel

4.2.16 The Commission noted with appreciation that the daily number of AMDAR reports circulated on the GTS is now typically above 250,000. The Commission was delighted to note that data density and overall distribution had improved in line with the number of reports received, and that the number of Members actively participating in the programme continued to grow.

4.2.17 The Commission congratulated the AMDAR Panel for the successful implementation of this highly important programme. It acknowledged the planned migration of the AMDAR programme to the WMO World Weather Watch Department at the request of WMO Congress (Cg-XIV) and the Executive Council (EC-LVII), and urged that this be expedited.

4.2.18 Some Members expressed the view that, after migration of the AMDAR programme to the WWW, the AMDAR Trust Fund would no longer be required, as funds should be available for AMDAR activities from the regular WMO budget. However, the Commission recognized that this was not the case now and was not guaranteed in future, so it urged Members to continue to contribute to the AMDAR Trust Fund to support the development activities of the Panel.

4.2.19 The Commission was pleased to learn that the Southern Africa Pilot Project has also finally become fully operational, not only making use of locally registered aircraft but also contracting international carriers to provide data on selected routes within the region. The Commission was further informed that the AMDAR coverage over Central and West Africa has grown substantially through the establishment of a targeted programme involving ASECNA and E-AMDAR. E-AMDAR profiles over Nigeria and Ghana are also provided by British Airways and Lufthansa. Although the Middle-East Pilot Project is still developing, there is already a significant coverage over this region.

4.2.20 The Commission was further informed that the development of a regional AMDAR programme in East Asia has made a significant contribution to improved data coverage in this area.

4.2.21 Concerning the new water vapour sensor (WVSSII), the Commission was requested to support the AMDAR programme by encouraging Members to actively engage in talks with air carriers in their countries about the installation of this sensor onboard their aircraft.

4.2.22 The Commission was informed about the merits of optimization schemes introduced by E-AMDAR and other national programmes in order to maximize the cost-benefit of AMDAR data, based on objective evaluation of impact studies.

4.2.23 Despite the overall high quality of AMDAR data, the Commission noted with interest the benefit of refined quality control procedures and the new training initiative aiming at maximizing the benefit of using AMDAR data in routine operational forecasting.

Establishment of a Trust Fund for access to WAFS products

4.2.24 The Commission recalled that, thanks to the generosity of Members, particularly the United States and the United Kingdom, the donation of equipment and the convening of training events in all WMO Regions in collaboration with WMO and ICAO had facilitated the implementation of the WAFS in many of the Least Developed Countries (LDCs). However, the Commission was aware that, as a result of rapid advances in satellite and computer technologies and advances in the operation of the World Area Forecast System (WAFS) to meet new aviation requirements, second-generation workstations with improved visualization software had been put in service in 2005 and would replace the first generation WAFS workstations by 31 December 2008.

4.2.25 In view of the need to assist LDCs to ensure sustainable access to WAFS products by the most appropriate means to meet aviation requirements, the Executive Council at its fifty-eighth session held in Geneva, in June 2006, requested the Secretary-General to establish a Trust

Fund to help meet the costs of assistance and urged donors to contribute to such a fund once established.

4.2.26 The Commission reviewed and endorsed the ToR (found in [Annex I](#) to the present report) of such a Trust Fund and called on Members to contribute to the Fund. The Commission further requested the Secretary-General to manage and administer the Trust Fund in accordance with WMO Financial Regulations.

Recent Developments in AMDAR and trends in Meteorological Data Downlink

4.2.27 The Commission was pleased to note the significant progress in the implementation of the AMDAR programme in Hong Kong, China, in particular, the operational use of high-resolution AMDAR wind observations from ascending aircraft for low-level wind shear reporting. The availability of AMDAR wind observations at 4-second resolution was able to capture the significant headwind variations associated with wind shear events. Further improvements to wind shear warnings could be expected from increased temporal resolution of reports to 1-second near the ground.

4.2.28 The Commission was also pleased to note that provisions were included in Draft Amendment 74 to ICAO Annex 3/WMO Technical Regulations [C.3.1] which would enable the provision of automatic air reports from aircraft to also cover aircraft equipped with secondary surveillance radar (SSR) Mode S or automatic dependent surveillance – broadcast (ADS-B) datalinks. With the implementation of these initiatives, it was envisaged that the WMO and ICAO programmes will complement each other to further increase the availability of upper-air meteorological data for the betterment of aeronautical meteorological services worldwide.

World Area Forecast System – UK Activities

4.2.29 The Commission was informed of the significant amount of effort expended in enhancements to the WAFS provided by the UK Met Office (UKMO) during the last four years and of the future plans for the further development of the WAFS, in response to actions called by the ICAO WAFSOPSG and SADISOPSG, the principal highlights being:

- (a) Introduction of BUFR-encoded SIGWX data and withdrawal of T4 formatted Wind/Temperature and SIGWX charts;
- (b) Development and implementation of gridded forecasts of Icing, turbulence and CB clouds;
- (c) Development and implementation of the SADIS 2G service;
- (d) Development of the SADIS FTP Server as a fully operational service;
- (e) The WAFCs will cease to include surface fronts/convergence zones and cloud type (apart from CB) in the SIGWX bulletins as specified by the Draft Amendment 74 to Annex 3;
- (f) By February 2008, the WAFCs will advance the issuance time of SIGWX products from the current 13.5 hours before validity time to 16 hours for SWM and 17 hours for SWH;
- (g) The WAFCs have been invited to undertake a study into the costs and benefits of issuing higher resolution gridded data. Current ideas centre on the addition of two further vertical levels between 300 hPa and 200 hPa, increasing the temporal resolution of WAFS GRIDS from 6-hourly to 3-hourly and improving the horizontal resolution from the current 1.25 x 1.25 degree to something in the order of 0.5 degree. The latter would mean a significant increase in data volumes with consequential impacts on data transmission speeds, satellite/FTP bandwidth and end-user systems;

- (h) The WAFCs have been invited to produce an implementation plan for the migration of WAFS gridded data from the GRIB1 Format to GRIB2. GRIB2 has a number of advantages over GRIB1 including the ability to use more efficient compression algorithms. This is particularly important if higher resolution grids are to be transmitted. Any change to GRIB2 will be done at the same time as higher resolution grids are introduced. Free software is available from WAFS Washington to convert GRIB2 files to GRIB1.

4.2.30 The Commission noted the views of IFALPA regarding the future use of the gridded forecasts of turbulence, icing and convection. In particular, studies should be conducted in close coordination with IATA and IFALPA if these gridded forecasts were to replace the SIGWX forecast charts in the future.

Migration of OPMET data to BUFR

4.2.31 The Commission noted the presentation by Canada and Hong Kong, China about perceived benefits, problems and opportunities arising from the proposed migration of OPMET data in the traditional alphanumeric codes (TAC) to Table Driven Code Forms (TDCF). The Commission was informed of the following outcomes of CBS-Ext.(06) held from 9 to 16 November 2006:

- (a) The planned completion of migration to BUFR was delayed by one year to 2016 in order to align this change with the ICAO Annex 3 update; and
- (b) CBS requested its Management Group to urgently establish an Inter-Commission dialogue between the relevant expert teams of CBS and CAeM in coordination with ICAO, with the remit to resolve concerns raised by Members regarding the migration of OPMET codes to TDCF.

4.2.32 Regarding cost-benefit justification and end-to-end data integrity, a number of Members shared the view that the use of a computer-only readable code such as BUFR for OPMET data exchange might jeopardize the availability of reliable OPMET data and there were no apparent benefits in the migration to BUFR until such time new products, such as a probabilistic terminal forecast, which could make use of the flexibility provided by BUFR for their delivery, were available. There was further concern that the BUFR migration would cause difficulties to Members in developing countries. The Commission was informed of IFALPA's view that if BUFR was used instead of TAC for transmitting OPMET data to pilots, extensive changes to the user's software and training would be required.

4.2.33 The Commission also noted that improved technical capabilities of aviation meteorological services providers in the field of observations, forecasts and warnings, and aeronautical users in data assimilation enable the provision of additional meteorological information beyond that provided by the current OPMET data. A review of the type and presentation format of the OPMET data including BUFR and XML was considered useful to identify the best approach to realize the benefits perceived by the Congress in the migration to TDCF and to justify the implementation cost, taking into account the latest developments in the exchange of aeronautical meteorological products such as the interoperability requirement of the Single European Sky.

4.2.34 After detailed discussions on the above, the Commission decided that the issue should be further considered, as proposed by CBS, by an Inter-Commission expert meeting to be held involving CBS, CAeM and ICAO. It requested the incoming president of CAeM to designate appropriate CAeM experts to be involved in this meeting.

5. TRAINING IN AERONAUTICAL METEOROLOGY (*agenda item 5*)

5.1 The Commission recalled that at its twelfth session (CAeM-XII), held in September 2002, it had approved Resolution 3 (CAeM-XII) establishing its Open Programme Area Group (OPAG) on Training, the Environment and New Developments in Aeronautical Meteorology (TREND) with the responsibility "To support Members in their drive to improve the qualification of meteorological personnel". This was to be achieved by helping to organize training events, collecting, reviewing and producing training material to be made available in electronic form on the AeMP Website and as appropriate in printed copies, and facilitating access to training material and methods designed by specialized institutions.

5.2 The Commission further recalled that in paragraph 3.4.3.3, the report of the Cg-XIV session indicated that "Congress recognized the additional need for conducting seminars on ATS/MET/Pilots Coordination, as well as roving seminars on cost recovery which should involve aviation stakeholders as well as NMS representatives". Congress was informed by ICAO that over the next few years there would be a requirement for training in at least five Regions to cover workstation operation and the display of WAFS products, and on the highly important issues of recovery of meteorological costs and quality management.

5.3 The Commission noted with appreciation that the Aeronautical Meteorology Programme (AeMP) Sixth Long-term Plan, (6LTP), in its paragraph 4.3.3 - Implementation of activities for the period 2004-2007, specifically singled out training as one of the three highest priorities, the two others being focus on aviation users and improved terminal forecasting. Furthermore, with regard to specialized training activities, the 6LTP put emphasis on nowcasting and very short-range forecasting techniques, and on ensuring that WAFS products are used to best advantage. Innovative approaches to training expected to be used included the establishment of CAeM as a clearinghouse for available materials and expertise.

5.4 The Commission commended the AeMP on the fact that since the last CAeM session in September 2002, sixteen important training events have been convened. The list of these events is given in [Annex II](#) to the present report.

5.5 The Commission supported the continuing efforts in training in four key areas and noted that important events had been held for each of these key areas, as follows:

– Quality Management

The ICAO Recommended Practice that Aviation Meteorological Service Providers should obtain Certification of the ISO 9001 family and the likelihood that this recommended practice may in due course become a requirement has focussed Members on the need to increase their efforts to become certified under ISO 9001. This in turn increased the urgent need for training in this field, which was responded to by holding the seminars in Hong Kong, China in November 2005 and Nairobi, Kenya in May 2006, and by planning a further seminar to be held tentatively early next year in Kazakhstan.

– Cost Recovery

In view of continuing budgetary cuts in public expenditure in many countries, the recovery of costs for aeronautical meteorological services has become imperative for Members. This was reflected by the fact that several such seminars were organized, in Tonga in 2004, Nairobi, Kenya in 2004, Moscow in 2006, Dakar in November of 2006, and a further one planned for December 2006 in the Dominican Republic which will also cover quality management.

– **AMDAR**

The use of AMDAR data to supplement sparse and costly radiosonde data has become a vital tool in the aeronautical meteorological forecasting activities of many Members. Consequently, AMDAR workshops and meetings were held in six locations (Budapest, Sofia, Beijing, Dubai, Johannesburg and Dakar).

– **Modern Forecasting Methods**

Scientific and technical workshops to ensure that forecasters are current in modern methodologies are a prerequisite for achieving the required high standards of quality and service in aeronautical meteorology. Such workshops and seminars were held in Canada, the United Kingdom, France and the United States of America.

5.6 The Commission further noted with satisfaction that specialized training events for the VCP programme, Volcanic Ash detection methods in cooperation with ICAO, the Development of management of NMHSs and for ATS/MET/Pilot coordination (in cooperation with ICAO) were held during the intersessional period.

5.7 The Commission noted with appreciation that extra-budgetary funds had been allocated to the AeMP Programme and that a number of extra training events have been made possible only due to this allocation.

5.8 The Commission was pleased to note that the establishing of the www.caem.wmo.int Website (which is also linked from the WMO Aeronautical Meteorology Programme Website) under the able leadership of Mr Ian Lisk (United Kingdom), the chair of the Expert Team on Education and Training, had improved considerably the availability of suitable, current and scientifically excellent training material on the web. The Commission further thanked the Met Office (United Kingdom), Météo-France (France), Belgocontrol (Belgium), Met Service of New Zealand, Meteorological Service of Canada, Bureau of Meteorology (Australia), Hong Kong Observatory and other Members as well as the US COMET programme among other institutions for allowing the use of some of its existing material on this Website. The Commission was impressed by the range and quality of this material and the host of information made available to Members through this site. The Commission expressed the view that in light of the importance and usefulness of this material, the incoming Expert Team should endeavour to find cost-effective ways of having the material translated into other WMO languages, possibly using skilled experts of the Commission rather than expensive external services.

5.9 The Commission suggested that the ET on Training, should continue its excellent work, and requested the Secretariat to continue to support the training activities that were so beneficial for Members, particularly in the developing world.

Guidance Material Published by WMO

5.10 The Commission noted with satisfaction that a number of Guides, Handbooks and other regulatory material had been revised, and were now ready or nearing readiness for publication.

5.11 The cooperation with ICAO resulted in the joint preparation and publication of the Updated Technical Regulations following the substantial Amendment No. 73 to Annex 3 of ICAO, and the preparation of a much-awaited Guide on Quality Management Systems, which will form the basis for national programmes and several training events.

5.12 The Commission noted with satisfaction that the *Guide to Practices for Meteorological Offices Serving Aviation* (WMO-No. 732), which had required a major review following the rapid technological and institutional advances in aviation meteorology, was now available in four languages.

5.13 The Commission was pleased to learn that the “Booklet on Aviation and the Global Atmospheric Environment”, after further consultation with ICAO, was now jointly published with UNEP in two languages.

5.14 The Commission agreed that whilst electronic versions of many Guides and Handbooks would become available in the future, the requirements for printed material would continue to exist for the foreseeable future.

5.15 The Commission reviewed the existing publications under its responsibility, and decided the following:

- 114 – *Guide to qualifications and training of meteorological personnel employed in the provision of meteorological services for international air navigation* – effectively replaced by WMO-No. 258 Fourth Edition and should be made obsolete;
- 364 – *Compendium of meteorology for use by Class I and II meteorological personnel, Vol. II, Part 2 – Aeronautical Meteorology* – now obsolete following publication of WMO-No. 258 Fourth Edition;
- 495 – *Handbook of meteorological forecasting for soaring flight* – in the process of being updated by OSTIV;
- 706 – *Meteorology in the service of aviation* – primarily a promotional document, now obsolete, could be considered for update;
- 731 – *Guide on Meteorological Observing and Information Distribution Systems for Aviation Weather Services* – new, 2006; retain;
- 732 – *Guide to Practices for Meteorological Offices Serving Aviation* – new; review in 2008;
- 770 – *Methods of interpreting numerical weather prediction output for aeronautical meteorology* – ET/ET to consider converting to soft copy for updating via Wiki processes on the CAeM website;
- 782 – *Aerodrome reports and forecasts: A user’s handbook to the codes* – to be updated after Amendment 74;
- 785 – *Proceedings of the WMO Technical Conference on Tropical Aeronautical Meteorology (TECTAM-92)* – retain as a factual record;
- 842 – *Guide to the provision of meteorological service for international helicopter operations* – a joint publication with ICAO who have recommended that it be made obsolete. Training material to be “extracted” from the document and placed on the CAeM website. Consideration to then be given to re-publishing as a new WMO document;
- 904 – *Guide on aeronautical meteorological services cost recovery – principles and guidance* – in the process of being updated;
- 930 – *Compendium on Tropical Meteorology for Aviation Purposes* by T.N. Krishnamurti, 2002 – retain;
- 1001 – *Guide on the Quality Management System for the Provision of Meteorological Service for International Air Navigation* – jointly published with ICAO – new;

Joint UNEP/WMO Booklet – *Aviation and the global atmospheric environment* – consider making obsolete after 4th IPCC Assessment Report.

UK Activities

5.16 The Commission was informed by the United Kingdom about the considerable efforts undertaken by the UKMO in training for aviation meteorologists from within the Met Office, other UK organizations and from a wide range of mainly developing countries. The session thanked the UK warmly for its long record of international cooperation and support particularly in the field of training, highlighting the following main areas of activity:

- (a) Observer training for UKMO and air traffic staff, where both theoretical and practical skills are taught and adherence to ICAO standards and recommended practices forms the underlying principle of the courses;
- (b) Forecaster training for UKMO and other NMHS staff; with a basic forecasting course based on the guidelines of the new WMO-No. 258 *Supplement for aeronautical meteorology*;
- (c) Training in support of WMO and ICAO international programmes: The implementation of WAFS and SADIS, and the migration to table driven codes were the subject of eight international courses held over the last four years;
- (d) The well known and much acclaimed UKMO Aviation Seminar was held every year with the support of WMO with participation by around 60 international aviation meteorologists from over 30 countries; and
- (e) In order to ensure that aviation weather products are well understood and used to the best effect by users ranging from private pilots to operations staff of airlines, courses for these user groups were held regularly by the UKMO.

6. ELECTION OF OFFICERS (*agenda item 6*)

6.1 Mr C. McLeod (Canada) was declared elected by acclamation as president of CAeM.

6.2 Mr C.M. Shun (Hong Kong, China) was declared elected by acclamation as vice-president of CAeM.

7. COOPERATION WITH OTHER BODIES AND INTERNATIONAL ORGANIZATIONS (*agenda item 7*)

7.1 The Commission recalled that Congress, in its Resolution 15 (Cg-XIV), requested the Executive Council, with the assistance of CAeM and other relevant Technical Commissions concerned (CAS, CBS and CIMO) to promote, guide and assist in the implementation of the Aeronautical Meteorology Programme. It also requested the Secretary-General to collaborate in the implementation of the Programme with ICAO, ASECNA, aviation user groups and other interested organizations.

7.2 The Commission also recalled that the ECL-VII session in May 2005 requested the Secretary-General and CAeM to continue to monitor closely the situation with regard to Single European Sky (SES) as well as its possible implication for meteorological service provision and cost recovery in other regions and to report to the Council highlighting implications and lessons learned. The EC session also encouraged collaboration on SES issues with EUROCONTROL and enhanced collaboration with IFALPA and IFATCA on relevant Aeronautical Meteorology Programme issues. The Commission noted with interest the activities of SESAR in Europe and NGATS in the US in the design and development of future air traffic systems which may impact future requirements for aeronautical meteorology. The meeting requested that the Commission be kept informed about the latest developments in these two important programmes, which could have repercussions also for other regions.

Cooperation with other Technical Commissions

7.3 The Commission was pleased to note the continued support provided to CAeM by CBS and CIMO Expert Teams tasked with code representation, scientific evaluation, AMDAR data calibration techniques as well as specifications for automatic observing systems at aerodromes. In parallel, CAeM members and the AMDAR Panel have been actively involved in the work of CBS and CIMO through their various Expert Teams. In this context, the Co-Chair of OPAG TREND, Mr H. Puempel, contributed to the Rolling Review of Requirements and participated at the meeting of the ET on Observation Data Requirements and Redesign of the GOS (ET-ODRRGOS), in July 2004. The AMDAR Panel Chairman and the TC attended a number of AMDAR related meetings both within and outside the WMO structure. These included meetings of the GOS (ET-ODRRGOS), the IOS Expert Team on Evolution of the GOS (ET-EGOS) in December 2005, seeking among others advice from the CBS ET-EGOS regarding the possible impacts of AMDAR water vapour data on weather prediction, aviation industry, and public safety following its operational implementation. The AMDAR TC also attended the CIMO-TECO in May 2005, and the Joint Meeting of the CIMO Expert Team on Upper-air Systems Intercomparisons and International Organizing Committee on Upper-air Systems Intercomparisons in November 2005.

7.4 The Commission was also pleased to note that the AMDAR Panel was represented at the meeting of the WMO Inter-Commission Task Group on the International Polar Year (IPY) 2007–2008, held in April 2005. In view of the potential opportunities that would result from the implementation of the planned Global Earth Observing System of Systems (GEOSS), the Commission shared the MG view that it should have a focal point for GEOSS.

7.5 The Commission noted with interest that with regard to the migration of AMDAR into the World Weather Watch GOS, the AMDAR/8 Panel meeting held in October 2005 sought guidance from the presidents of CAeM and CBS on further steps to be taken toward the integration of AMDAR into the WWW Programme. In this context the Commission was informed that the results of the survey on AMDAR training requirements, conducted by the Secretariat in November 2005 have been analysed, posted in the AeM Website and distributed by the WMO Secretariat to WMO Members in February 2006.

7.6 The Commission noted also with interest that the eighth session of the Science Steering Committee for WWRP held in October 2005, in recognition of the requirements and priorities of the aviation industry for weather information, expressed the need to develop in close cooperation between CAS and CAeM, a new project on aviation forecasting and related weather hazards. In this regard, the Commission endorsed the CAeM MG conclusion to liaise with CAS to ensure CAeM involvement from the beginning with research projects fostered by WWRP that are of interest to the work of the Commission.

Cooperation among WMO and ICAO and other International Organizations

7.7 The Commission was pleased to note the mutual participation of ICAO and WMO at relevant meetings convened by the two Organizations and the extensive and fruitful consultation and cooperation in developing guidance and regulatory material in aeronautical meteorology.

7.8 The Commission was also pleased to note the active cooperation with ICAO ASECNA, EUMETNET, EUROCONTROL and other stakeholders in the work of CAeM during the intersessional period. The Commission encouraged close collaboration among the WMO representatives and experts from NMHSs who would assist national experts or delegations for future meetings such as ICAO Air Navigation Services Economics Panel (ANSEP) to promote the interest of NMHSs.

7.9 The Commission noted with interest that two members of the MG and a secretariat representative attended a meeting on Single European Sky (SES) matters with representatives of EUROCONTROL at the headquarters of this organization in November 2005.

7.10 The Commission noted also with interest that the European Commission's 6th Framework Project "Flysafe", that is designing a new integrated system of on-board sensors and uplinked information on terrain, traffic and weather hazards had expressed an interest in closer liaison with the Commission.

7.11 With regard to overall coordination in WMO cross-cutting matters, the Commission endorsed the MG proposal highlighting that any new structure for the Commission could usefully involve the designation of focal points to ensure this coordination and the due consideration of CAeM's needs and interests.

Development of New Wind Shear Posters in Collaboration with IFALPA and ICAO

7.12 The Commission was pleased to note an initiative to develop new wind shear posters as a joint effort of WMO, IFALPA, ICAO and the Hong Kong Observatory (HKO), Hong Kong, China. The objective of the posters was to promulgate the current knowledge of low-level wind shear/turbulence hazards and their alerting techniques to pilots and meteorologists, for training and educational purposes.

7.13 The Commission noted with appreciation that this quadripartite collaboration between WMO, IFALPA, ICAO and HKO would be a good example of cooperation with other bodies and international organizations, considering in particular its contribution to aviation safety.

7.14 The Commission noted with interest that the new posters were being developed by HKO in collaboration with WMO and IFALPA based on information from the Booklet on "Windshear and Turbulence in Hong Kong – information for pilots" published by Hong Kong Observatory in cooperation with IFALPA. It was envisaged that the posters would broadly cover the causes of wind shear (thunderstorms, terrain, sea breeze and low-level jet), nature of wind shear, wind shear alerting techniques, and how pilots prepare for wind shear encounter. The posters would also take into account the different airport environment around the world while giving clear and concise messages tailored for the end users. Coordination between the organizations would be made to promote the widest distribution of the new posters to end users and interested recipients. It is expected that the new posters will be reviewed by the ICAO WISTSG and subsequently included in the list of ICAO audiovisual aids.

8. CROSS-CUTTING ISSUES (agenda item 8)

WMO INFORMATION SYSTEM (WIS)

8.1 With respect to the WMO Information System (WIS), the Commission recalled the proposals of CBS and the corresponding decisions of Cg-XIV and of the subsequent fifty-fifth to fifty-seventh sessions of the Executive Council. The Commission noted that the GTS would evolve as the core network of the WIS, which would, based on international ICT standards, facilitate real-time, coordinated "push-pull" services for operational, time-critical applications, and information discovery, access and retrieval services of all WMO and relevant co-sponsored international programmes, such as research, climate and environmental applications and programmes, as well as for eligible non-NMHSs users at national level.

8.2 It was noted further that EC-LVII (2005) had realized the important role WIS played in contributing the essential data exchange and data management services to the GEOSS and in facilitating the effective role of all NMHSs in disaster mitigation and prevention activities and warning systems. In the aftermath of the December 2004 Tsunami catastrophe, the importance of WIS was further demonstrated as the international community recognized that WMO's GTS of today, and consequently WMO's WIS of tomorrow, served as the backbone network for real-time information exchange in support of multi-hazard, multi-purpose natural disaster early warning systems. EC-LVII had requested to expedite the development of key components of WIS with a view to beginning implementation, at least in some countries, in 2006 instead of 2008, as originally planned.

8.3 The Commission emphasized that WIS would be very relevant for the future efficient implementation of its programme activities. Specifically the non-real-time information exchange of aeronautical meteorology projects and of inter-disciplinary applications related to CAeM programmes and the real-time data exchange in support of operational applications were expected to benefit from WIS. WIS was also expected to provide efficient information discovery, access and retrieval services. Noting the accelerated plan for implementation of WIS, the Commission requested the research and operational data centres serving aeronautical meteorology to define and coordinate their WIS requirements, including network connectivity, data formats and metadata. It also agreed to participate actively in the development of WIS-related data management functions with a view to ensuring that relevant on-line catalogues and metadata were well defined, as well as information representation formats and codes being fully suitable and supportive to CAeM programme needs.

8.4 In light of the diversity of users and participating programmes, it was agreed to work towards limiting the number of standard formats so as to facilitate an efficient use of WIS. The Commission also noted the issue of large data volumes generated, mainly in connection with research projects, and agreed to liaise with CBS to ensure that the needed transmission bandwidths are planned in WIS between centres concerned. Noting the heavy overhead involved in downloading large, complex data sets required under some of its programme activities, the Commission recommended to the network planners to centralize such processes in regions or sectors and to apply local knowledge and services to broker out the information to end users. Such an approach would enable in particular remotely located sites, e.g. small island states or developing countries with limited ICT infrastructure, to receive relevant data sets.

8.5 Furthermore, the Commission stressed the need for transparent and coordinated governance mechanisms to ensure that programmers understand how they could participate, introduce requirements, and monitor the implementation. The Commission agreed that it was critical that WMO gave specific attention to developing countries with respect to their WIS-related requirements and capabilities so that these countries could participate in and benefit from relevant CAeM programme activities.

8.6 The Commission noted that in order to ensure the continued free and efficient information exchange between the WIS and ICAO systems such as SADIS, ISCS and AFS, ICAO should be informed of and alerted to the implications of the new WIS on data exchange between the two organizations.

8.7 With a view to ensuring optimal benefit for CAeM programme activities, derived from the evolving WIS, the Commission decided on the following priority actions that would need to be addressed:

- (a) Review and/or define CAeM programme-specific extensions to the WMO Metadata Core Profile and coordinate them through the Meeting of the Presidents of the Technical Commissions (which will serve as the clearing house for this purpose);
- (b) Identify the relevant CAeM expert teams and establish appropriate working mechanisms to address specific requirements with respect to data management, data discovery and retrieval.

8.8 While confirming the important roles of the Inter-Commission Coordination Task Group on WIS established by the Executive Council and the Meetings of the Presidents of Technical Commissions, in which CAeM was represented, for the inter-programme coordination of WIS, the Commission saw the need to set up and strengthen its direct participation in the WIS design and development work. The Commission requested the incoming president of CAeM to nominate a Focal Point on WIS matters, with terms of reference as follows:

- (a) Coordinate the definition of WIS-related requirements of the aeronautical meteorology community specifically with respect to information discovery, access and retrieval services;

- (b) Coordinate the definition of WIS-related requirements of the aeronautical meteorology programme specifically with respect to operational, time-critical applications so that relevant data be available to users on-line and in near real-time;
- (c) Participate, on behalf of the Commission, in the work of the relevant WIS planning and coordination teams and to submit an annual progress report to the president. In addition the Commission requested its Management Group to stay abreast of the development and implementation of WIS, coordinate collaboration with CBS as necessary, oversee the above priority actions, initiate corrective measures as needed, and initiate other actions necessary to ensure full participation of CAeM in the WIS.

International Polar Year 2007–2008

8.9 The Commission recalled Resolution 34 (Cg-XIV) that had approved the holding of the International Polar Year (IPY) in 2007–2008. It recognized that the IPY 2007–2008 should result in an intensive campaign of internationally coordinated, interdisciplinary research and observations focused on the Polar Regions. The Commission noted that the IPY Joint Committee established by WMO and ICSU as lead agencies for IPY made a substantial contribution to the IPY preparation by stipulating and coordinating over 400 project proposals that resulted in 229 endorsed IPY projects. It also noted that in order to coordinate IPY activities within WMO, in particular among technical commissions and NMHS, EC-LVI established an Intercommission Task Group (ITG) on the IPY, which includes Mr C. McLeod (Canada) as representative of CAeM. The Commission was pleased to learn that the ITG had developed a number of recommendations to technical commissions that were very helpful in preparation of the IPY project proposals and noted with appreciation the contribution made by the AMDAR Panel.

8.10 The Commission stressed that the integrated observing component of the IPY should include among other observing facilities an extension of the AMDAR programme to cover Polar Regions during the IPY implementation phase. In this connection the Commission expressed its appreciation to Australia, Canada, Chile, Germany, Sweden, the USA and E-AMDAR for their intention to develop a network of AMDAR observations over the high latitudes of the Arctic, Antarctica and the Southern Ocean and encouraged them and other relevant Member countries to complete such national and international programmes in time to be implemented during the IPY in order to provide a valuable set of upper-air data.

8.11 The Commission recognized that successful implementation of IPY required strengthening of the technical and logistical infrastructure for operations and research during the preparation and implementation of the IPY. It therefore requested the AMDAR Panel to consider an extension of the AMDAR Programme to the Polar Regions in the IPY period as a matter of high priority and maintain close contacts with the Joint Committee for IPY and its Sub-Committee on Observations.

The Role of Aeronautical Meteorology in Disaster Risk Reduction, Prevention and Mitigation and Emergency response

8.12 The Commission noted that WMO established a new cross-cutting programme for National Disaster Prevention and Mitigation (DPM) (Cg-XIV, EC-LVI, EC-LVII and EC-LVIII) with the vision to further strengthen the contributions of the National Meteorological and Hydrological Services (NMHSs), in a more cost-effective, systematic and sustainable manner for improving safety and well being of communities.

8.13 The Commission was informed of the need for improved communication and coordination between aeronautical meteorology service providers and other meteorological agencies or departments from Tropical Cyclone Advisory Centres to Hydrological departments and Public Weather Service departments within NMHSs on the one hand and Emergency Response, Disaster Relief and Recovery agencies on a national, regional and international level in order to improve all aspects of Disaster Risk Reduction and Mitigation in the areas where aviation plays a crucial role.

8.14 The Commission noted that the proven skill in forecasts and warnings beyond 24 hours could be usefully applied to aeronautical meteorological operational products used in advance flight planning and encouraged the Secretary-General to jointly develop contingency plans for Disaster Risk Reduction, Emergency Response and Recovery with ICAO.

8.15 The Commission endorsed plans for a Pilot Project in cooperation with the Hong Kong Observatory, other interested Members in the Region, Airlines, ICAO and the WMO Secretariat to study:

- (a) The feasibility of providing on an operational basis aviation weather forecasts and warnings in particular for severe convection, floods and Tropical Cyclones in close cooperation with all aviation stakeholders;
- (b) The skill of such forecasts and warnings for 24-48 hours ahead;
- (c) The benefits to aviation in particular and in general to the population in the regions affected by natural disasters.

8.16 The Commission encouraged the incoming Management Group, its appropriate Expert Teams and Focal Points to liaise with the relevant bodies involved with Disaster Prevention and Mitigation in order to ensure that aeronautical meteorology was enabled to play a proactive role in this field of action.

8.17 The Commission adopted [Resolution 1 \(CAeM-XIII\)](#).

Pilot Project to Develop Support for Developing Countries in AeMP in RA II

8.18 The Commission was informed about the Pilot Project to Develop Support for Developing Countries in the Aeronautical Meteorology Programme established by Regional Association II (Asia) during its thirteenth session held in Hong Kong, China, from 7 to 15 December 2004. The Pilot Project was coordinated by a Coordination Group comprising experts from the Region.

8.19 The Commission welcomed the initiatives of RA II in establishing the Pilot Project and shared the views of RA II that: (i) weather information is important to the safe operation of aviation; (ii) LDCs are in need of assistance in building capacity in the provision of aviation weather services; and (iii) the long established tradition of partnership, mutual cooperation and sharing of weather products among WMO Members should be continued.

8.20 The Commission noted the good progress of the Pilot Project. In particular, a test version of the Pilot Project Website (www.aamets.org) was launched by China providing a host of numerical weather prediction guidance products.

8.21 The Commission was pleased to note that Member's support was received for further development and quick implementation of the Pilot Project Website for use by aviation weather forecasters in RA II and that China planned to organize, jointly with WMO, a training seminar for aviation weather forecasters in the Region on aeronautical meteorological service and the use of the guidance products on the Pilot Project Website. The seminar was scheduled to last 3 days and to be held in Beijing, China, from 6 to 8 March 2007. The Commission welcomed the offer by the China Meteorological Administration to provide partial funding, as a contribution to the WMO Voluntary Cooperation Programme, to support participants from Members of developing countries in the Region and agreed that WMO should assist the preparation of the seminar including financial assistance for participants from Least Developed Country Members in the Region.

8.22 While recognizing and appreciating the initiative within RA II to provide support for developing countries, particularly in terms of guidance for production of TAF and SIGMET, the Commission also noted the information provided by the ICAO observer which emphasized that under Draft Amendment 74 to Annex 3 products provided for flight documentation purposes shall, unless ICAO States notified a difference, be those from the WAFS.

9. FUTURE PLANS AND PRIORITIES, INCLUDING THE LONG-TERM PLAN (agenda item 9)

Implementation of the Sixth Long-term Plan

9.1 The Commission recalled that the fifty-fifth Executive Council (EC-LV) session in 2003 was pleased to note that among the most important decisions of the twelfth session of CAeM in 2002, had been the improvement and endorsement of the 6LTP for the Aeronautical Meteorology Programme. Furthermore, the Fourteenth Congress requested the Executive Council to use the 6LTP as a benchmark for monitoring progress in the implementation of WMO Programmes and activities, which would help the Organization and its Members in evaluating their performance in relevant areas.

9.2 The Commission noted with interest the major results of the baseline count survey on the implementation of the aeronautical meteorology component of Sixth WMO Long-term Plan 2004-2007 conducted by the Secretariat in May 2004 and addressed to all WMO Members in February 2005. The Commission was pleased to note that the CAeM Management (MG) Group meeting held in Boulder (USA) in April 2006 discussed these results related to the replies of 83 Members that have kindly completed and returned to the Secretariat the questionnaire. As a result and in concordance with the MG suggestion related to the assessment of progress at the halfway point in the 2004-2007 period of the 6LTP, the Secretariat conducted the second survey on the implementation of the AeMP 6LTP – 2004-2007 in May 2006. The results were disseminated to Members in July 2006.

9.3 The Commission requested its president to share the Commissions experience of using performance indicators gained during the current financial period with other Technical Commissions through the annual Meetings of the Presidents of Technical Commissions.

9.4 The Commission noted with appreciation the improvements that could be seen in several areas of the AEMP through the progress from the baseline to the mid-point survey of Members on their activities in the field of aeronautical meteorology. The Commission, however, was also informed that this limited progress could only be achieved through the dedication of many experts working during their free time, and the use of extrabudgetary funds that have been made available on a one-off basis to compensate for the extremely limited regular budget for the programme.

9.5 The Commission noted with appreciation the kind offer of the Russian Federation to hold a Workshop in the second quarter of 2007 in Moscow on the improvement of aviation meteorological service provision for the air navigation authorities of the region.

Plans for 2008–2011

9.6 The Commission was informed of progress being made by the Executive Council on its preparation of the WMO Strategic Plan 2008–2011, which would be proposed for adoption by Congress in 2007. It noted the change in emphasis by calling it a strategic rather than a long-term plan, as had been the terminology used for the previous 6LTP. It also noted that the strategic plan would be a simpler and more focussed document than the 6LTP, would be limited to the four years 2008 to 2011, but would preserve the 6LTP Vision as well as many of the elements of the outcomes and strategies. It was also intended to form the basis for the Results Based Budgeting proposals of the Secretary-General.

9.7 The Commission noted that the Aeronautical Meteorology Programme will contribute to at least five of the eleven Expected Results identified in the WMO Strategic Plan:

- Expected Result 1: Enhanced capabilities of Members to produce better weather forecasts and warnings;

- Expected Result 6: Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness;
- Expected Result 7: Enhanced capabilities of Members to provide and use weather, climate, water and environmental applications and services;
- Expected Result 8: Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations;
- Expected Result 9: Enhanced capabilities of Members in developing countries, particularly Least Developed Countries, to fulfil their mandates.

9.8 The Commission recalled that previous WMO Long-term Plans had included a specific section on the Aeronautical Meteorology Programme in a Chapter dealing with all the scientific and technical programmes of WMO. Details of the 6LTP AeMP component, together with performance indicators, had been considered earlier under this agenda item.

9.9 The Commission noted that, in future, individual plans for the WMO Programmes and major activities would respond to the Strategic Plan. It expressed appreciation for the work done by the Management Group at its session in Boulder, USA, from 4 to 7 April 2006 on its review of the previous 6LTP AeMP component, and preparation of a proposed plan for the AeMP for 2008–2011.

9.10 The Commission agreed with the assessment of the Management Group that it was important in the AeMP Plan to focus on where the Commission and the Secretariat were adding value by assisting WMO Members in their own provision of aeronautical meteorological services. It reviewed the draft AeMP Plan prepared by the Management Group, made a number of suggestions for improvement, and endorsed in general the overall AeMP Plan as contained in [Annex III](#) to the present report.

9.11 The Commission requested its incoming Management Group to continue to refine the AeMP Plan as necessary, in particular to ensure that it was well aligned with the requirements of the WMO Strategic Plan 2008–2011, and that the planned activities matched both appropriate Expected Results and resources allocated within the Programme and Budget to carry out the activities. It also requested the MG to develop appropriate Key Performance Indicators and/or Targets. It requested the Secretariat to continue to monitor progress achieved in the AeMP through bi-annual surveys of Members.

9.12 The Commission urged that there be maximum benefit from any resources expended on classroom training sessions. It noted the positive experiences of providing preparatory and post training course e-learning resources for information for and input from participants. It felt that there must be clear objectives, and the success of the course in achieving those learning objectives should be evaluated. The evaluation should be taken into account in design of future courses and the selection criteria for future attendees.

9.13 The Commission requested its Members to conduct and publish studies on the economic impacts of weather, and on the benefits of weather forecast services on aviation operations, which would assist all Members in their business cases for future investment. The Commission noted that ICAO had recently developed CNS/ATM Systems Implementation Business Case Software, and the ICAO observer acknowledged the request of the Commission to investigate its applicability to aeronautical meteorological services.

9.14 With regard to resources available for implementation of the AeM programme, the attention of the Commission was drawn to Programme and Budget proposals available in documents for the forthcoming Fifteenth Congress. Under these proposals, there would be insufficient funds available to perform the activities of the AeMP in support of the WMO Strategic Plan. The Commission expressed its dissatisfaction that the budget proposals did not reflect the request of the fifty-eighth session of the Executive Council to the Secretary-General to “endeavour to provide increased resources to the Aeronautical Meteorology Programme, which currently represented about

1 percent of the WMO budget, while aeronautical meteorology brought in as much as 30% of the budgets of many NMHSs". The Commission requested its incoming president to draw this situation to the attention of Congress. The president requested Members of the Commission to inform and involve their national delegations to Congress to seek sufficient resources for the AeM programme. The Commission recognized that unless the situation improved, the incoming MG would have to curtail a significant proportion of its planned activities to the detriment of all Members, particularly developing countries, and also affecting the implementation of the WMO Strategic Plan.

10. CAeM STRUCTURE AND ESTABLISHMENT OF OPAGs AND EXPERT TEAMS (agenda item 10)

10.1 The Commission was informed of its Management Group (MG) session held in Boulder, USA in April 2006, expressed its gratitude for the work done by the Commission under its current structure, and noted that responsibilities were shared among Management Group members so that each member had effectively a role to play in implementing the Programme. However, the Commission was further informed that the need to fill the positions of chair for all eight Expert Teams under the two OPAGs (TREND and PROMET) and to find a sufficient number of active team members to carry out the ambitious work programme of the teams had proven difficult. In particular, primarily because of financial constraints, only one Expert Team had been funded to hold a meeting whilst all the others had to work by correspondence, which had limited the effectiveness of these teams. The Management Group therefore decided after careful consideration and discussion to propose to the Commission to adopt a streamlined structure, focussed on the essential roles that the Commission must play and being more in line with the available resources in terms of expert participation and available funding.

10.2 The Commission endorsed the proposal of the Management Group and established a new structure consisting of the CAeM Management Group, Expert Teams and Expert Network, and a Rapporteur considered necessary for the work of the Commission between its thirteenth and fourteenth sessions. It agreed on following aspects of the structure:

- An Expert Team would be an open working group, but with a core membership, and would be expected to hold one or two intersessional meetings of the core group, subject to available resources;
- The Expert Network would have a Chair who would act in a role similar to the Chair of an Expert Team, through involving as appropriate a network of experts in that field or fields. Communication would be almost exclusively electronic. A meeting would only be held if it was necessary for a few active experts to address a specific focussed task. However, the Chair and/or vice-Chair and/or specific experts from the Network would be likely to participate in cross-cutting teams involving different Technical Commissions or Programmes of WMO;
- A Rapporteur would be an individual acting in the normal fashion of keeping abreast of an issue and informing the Commission of relevant developments, as well as promoting the Commission's interests;
- A focal point would be an individual expert who represented the Commission through active involvement on other WMO activities or bodies.

10.3 The Commission reaffirmed its commitment to the main long-term objective of the Aeronautical Meteorology Programme to ensure the worldwide, reliable provision of good quality, timely, cost-effective and responsive meteorological service to users throughout the world in support of safe, regular and efficient aviation operations. It agreed that to meet this objective, and achieve the Plan of the AeMP as agreed under agenda item 9, consistent with the WMO Strategic

Plan 2008–2011, the work of the Commission could best be accomplished through the following structure:

- (a) The Management Group, which would operate in an empowered fashion with the ability to take decisions on behalf of the Commission in the intersessional period in matters of urgency. The group would consist of:
 - The president (also taking the lead on Cross-cutting Issues) and vice-president of the Commission (taking the lead on Advice Provision);
 - The Chair of the Expert Team on Training and Education;
 - The Chair of the Expert Team on New Terminal Weather Forecast;
 - The Chair of the Expert Team on Customer Relations;
 - The Chair of the Expert Network;
 - Other experts as required to ensure regional representation, who would also take the lead on regional matters;
- (b) Three Expert Teams:
 - Expert Team on Training and Education;
 - Expert Team on New Terminal Weather Forecast;
 - Expert Team on Customer Relations;
- (c) One Expert Network;
- (d) One Rapporteur:
 - Rapporteur on Aviation and the Environment;
- (e) Focal points as required and designated by the president.

10.4 The Commission noted that in previous discussions it had requested its president to designate focal points for WIS, DPM, and gender issues.

10.5 The Commission, noting the increased importance of the activities of CAeM groups, encouraged its president and the WMO Secretariat to keep members of the Commission informed by all appropriate means of progress in the work by distributing through the AeMP Website, the dedicated Website for training and Commission information www.caem.wmo.int, and as appropriate circular letters from the president of CAeM, reports of sessions and newsletters, etc.

10.6 The Commission adopted [Resolution 2 \(CAeM-XIII\)](#) and [Resolution 3 \(CAeM-XIII\)](#).

11. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS (agenda item 11)

In accordance with established practice, the Commission reviewed those resolutions and recommendations adopted prior to its thirteenth session, which were still in force and adopted [Resolution 4 \(CAeM-XIII\)](#). The Commission also examined the resolutions of the Executive Council related to aeronautical meteorology and adopted [Recommendation 1 \(CAeM-XIII\)](#).

12. SCIENTIFIC LECTURES (*agenda item 12*)

12.1 The president of the Commission introduced Mr Ralph Petersen who delivered a Memorial Lecture in honour of the late Charles Sprinkle, former president of the Commission from 1990 to 1999.

12.2 The Commission warmly thanked Mr Petersen for his excellent lecture.

13. ANY OTHER MATTERS (*agenda item 13*)

Participation of Women in the work of the Commission: nomination of a gender focal point

The Commission noted the recommendations of the Second WMO Conference on Women in Meteorology and Hydrology (Geneva, March 2003) and Resolution 33 of the Fourteenth World Meteorological Congress (Cg-XIV), which calls for equal opportunities for the participation of women in meteorology and hydrology and noted the past efforts of the Commission to strengthen the participation of women in the work of the Commission. Recognizing that these efforts need to be revised and strengthened with new initiatives on a continuous basis, the Commission adopted [Resolution 5 \(CAeM-XIII\)](#) and designated Ms M. Petrova (Russian Federation) as the CAeM focal point for gender issues. The terms of reference of the gender focal point are included in [Annex IV](#) to the present report.

14. DATE AND PLACE OF THE FOURTEENTH SESSION (*agenda item 14*)

14.1 The Commission was informed that the fourteenth session of the Commission was scheduled to be held in 2009 or 2010.

14.2 The actual date and place would be announced at a later date.

15. CLOSURE OF THE SESSION (*agenda item 15*)

Following the exchange of customary courtesies, the thirteenth session of CAeM closed at 4:08 p.m. on 30 November 2006.

RESOLUTIONS ADOPTED BY THE SESSION

Resolution 1 (CAeM-XIII)

DISASTER PREVENTION AND MITIGATION (DPM) FOCAL POINT

THE COMMISSION FOR AERONAUTICAL METEOROLOGY,

Noting:

- (1) The need for coordination with all aviation stakeholders in emergency preparedness and planning in the event of potential disasters,
- (2) The need for preparing adequate regulations in cooperation with ICAO and national to local emergency planners in the field of observations, forecasts and warnings for aviation in case of natural disasters and resulting emergency situations,
- (3) The need to provide guidance and support to Members in providing aeronautical meteorological services to aviation operations in support of emergency response and relief operations,

Considering that the Aeronautical Meteorology Programme could have a strong positive impact on emergency preparedness, relief and recovery in reducing the impacts of natural disasters,

Decides:

- (1) To appoint a DPM Focal Point with the following terms of reference:
 - (a) To liaise with NMHSs' aeronautical meteorology departments in order to assess their requirements for guidance, training and infrastructure needed in support of emergency planning, preparedness, response and relief operations;
 - (b) To liaise with aviation stakeholders and humanitarian agencies in order to create a common understanding of how aeronautical meteorology can contribute to emergency planning, response and relief;
 - (c) To review the existing regulations within WMO and ICAO with a view to suggest additions and improvements that would benefit emergency preparedness and response;
 - (d) To coordinate Commission activities related to the WMO DPM Programme;
 - (e) To liaise with DPM focal points of other technical commissions, with the Chairperson of the DPM working groups of the regional associations and the Secretariat and key partners such as ICAO, humanitarian and development agencies to identify and develop plans for joint projects and activities to ensure that aeronautical meteorology was enabled to play a proactive role in this field of action and that the expertise of WMO structures can be utilized most effectively as relevant to Commissions activities;
 - (2) To request the president of CAeM to designate a DPM Focal Point for the Commission of Aeronautical Meteorology;
 - (3) To request the Focal Point to report regularly to the president and the MG of CAeM on his activities and progress.
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Resolution 2 (CAeM-XIII)

THE MANAGEMENT GROUP OF THE COMMISSION FOR AERONAUTICAL METEOROLOGY ("CAeM MANAGEMENT GROUP")

THE COMMISSION FOR AERONAUTICAL METEOROLOGY,

Noting:

- (1) The very effective experience and successful activity of the current CAeM Management Group,
- (2) The report of the president of the Commission to CAeM-XIII,
- (3) The need to share responsibilities among the Management Group members so that each member had effectively a role to play in implementing the Programme,

Recognizing that:

- (1) The effectiveness of the Commission depends to a large extent on the effective management of its activities during its intersessional periods,
- (2) The Management Group is required to ensure the integration of activities of the Commission, evaluate the progress achieved, coordinate strategic planning and in matters of urgency take decisions on behalf of the Commission as well as decide on necessary adjustments to achieve the objectives of the Programme,

Decides:

- (1) To re-establish the CAeM Management Group (CAeM-MG) with the following terms of reference:
 - (a) To assist the president in guiding and coordinating the activities of the Commission and its working groups;
 - (b) To take responsibility for achieving results under WMO Plans directly and through the activities of Expert Teams and Expert Networks under their leadership;
 - (c) To ensure that the activities of the Commission meet the needs of developing countries; in particular in Training in aeronautical meteorology, as well as in implementing Quality Management and Cost Recovery Programmes;
 - (d) To ensure that members are informed of the activities of the Commission, through the AeMP and CAeM websites and other means;
 - (e) To ensure cooperation with other WMO bodies in pursuit of WMO strategic goals;
 - (f) To assist the president, as required, to take decisions on behalf of the Commission during the inter-session period on matters of urgency;
- (2) That the composition of the CAeM Management Group shall be as follows:
 - (a) The president of CAeM (Chair);
 - (b) The vice-president of CAeM;

- (c) The Chairs of the:
 - Expert Team on Training and Education;
 - Expert Team on New Terminal Weather Forecast;
 - Expert Team on Customer Relations;
- (d) The Chair of the Expert Network;
- (e) and other members (Mr G. Flores (Argentina), Rapporteur on Regional Aspects of the Aeronautical Meteorology Programme (AeMP) in Region III, Mr Tan Huvi Vein (Malaysia), Rapporteur on Regional Aspects of the Aeronautical Meteorology Programme (AeMP) in Region V, a Rapporteur on Regional Aspects of the Aeronautical Meteorology Programme (AeMP) in Region I to be designated by XIV-RA I) as required for regional representation;

Requests the Secretary-General to invite ASECNA, IAOPA, IATA, ICAO, IFALPA, IFATCA, IPCC, and other appropriate international organizations by agreement with the president, to participate in the work of the Management Group;

Authorizes the president to invite such additional experts as are necessary, resources permitting, to participate in meetings of the Management Group.

Resolution 3 (CAeM-XIII)

EXPERT TEAMS, NETWORK AND RAPPOREUR OF THE COMMISSION FOR AERONAUTICAL METEOROLOGY

THE COMMISSION FOR AERONAUTICAL METEOROLOGY,

Noting:

- (1) The pressing need for continued efforts in education and training in aeronautical meteorology,
- (2) The need, based on an in-depth understanding of the users' requirements, to provide new and improved services to aviation for the 21st Century,
- (3) The need to institutionalize Quality Management, Cost Recovery and Customer Focus programmes,

Considering:

- (1) The potential benefit of the introduction of new and improved services to aviation,
- (2) The requirement for the development of standardized methods for the quality assurance of meteorological data and services,
- (3) The important role that aeronautical meteorology plays in the economic and technological development of Members,
- (4) The need to adapt content and format of forecasts and observations to the requirements of new concepts of air traffic management,

- (5) The growing evidence of the effects of aviation both on local air quality and on climate change,

Decides:

- (1) To establish a number of small and focussed Expert Teams, an Expert Network, and a Rapporteur, to tackle specific issues, with the following terms of reference:
- (a) To support Members in their drive to improve the qualification of meteorological personnel. This is to be achieved by helping to organize training events, collecting, reviewing and producing training material and resource information to be made available on the CAeM Website and as appropriate in printed copies;
 - (b) To develop in close cooperation with the relevant bodies of ICAO proposals for a new terminal weather forecast adapted to the needs of the 21st Century;
 - (c) To assist Members in the introduction of recognized systems of Quality Management, Cost Recovery and Customer Focus programmes;
 - (d) To develop guidance on the provision of new and tailored services for all aviation stakeholders including airlines, commercial and general aviation, national and regional air traffic management and airport operators;
 - (e) To cooperate with ICAO through the WMO Secretariat in the improvements to observations, the updating of codes and formats including the transition to table-driven codes in all areas of information transmission;
 - (f) To provide input and feedback for relevant bodies of CBS, CIMO and CAS in planning for new data types, observing and forecasting methodologies;
 - (g) To inform the Commission of the current scientific understanding of the effects of aviation on the global, regional and local atmospheric environment, the implications thereof for future development of aviation, and of potential effects of impending climate change on aviation operations. The Rapporteur will also liaise with other organizations such as CAS, UNFCCC, IPCC and UNEP and scientific societies to ensure that information is current and complete;
- (2) To select, in accordance with General Regulation 32 of the WMO General Regulations:
- Mr Ian Lisk (United Kingdom) as the Chair of the Expert Team on Training and Education;
- The following five experts as core members of the Expert Team on Training and Education:
- Ms A. Henderson (Australia)
 - Mr R. Windmolders (Belgium)
 - Mr E.D. Kafi (Sudan)
 - Mr S. Baig (Trinidad and Tobago)
 - Mr C. Weiss (United States of America)
- Mr Kevin Johnston (United States of America) as the Chair of the Expert Team on New Terminal Weather Forecast;

The following five experts as core members of the Expert Team on New Terminal Weather Forecast:

Ms S. Lawrence (Australia)

Mr K. Johnson (Canada)

Ms J. Hu (China)

Ms S. Desbios (France)

Ms M.K.S. Song (Hong Kong, China)

Ms Marina Petrova (Russian Federation) as the Chair of the Expert Team on Customer Relations;

The following five experts as core members of the Expert Team on Customer Relations:

Ms J. Lancaster (Canada)

Mr E. Lorenzen (Germany)

Ms A. Reynolds (United Kingdom)

Mr N.S. Kuwese (United Republic of Tanzania)

Mr T. MacPhail (United States of America)

Mr Denis Lambergeon (France) as the Chair of the Expert Network;

Mr Bryan Boase (Australia) as the vice-Chair of the Expert Network;

Mr David Lee (United Kingdom) as the Rapporteur on Aviation and the Environment;

Authorizes the president, in consultation with the Management Group and the Permanent Representative of the Member concerned, to replace a Chair or core member should that person be no longer able to fulfil his or her responsibilities;

Requests the Secretary-General to invite ASECNA, IAOPA, IATA, ICAO, IFALPA, IFATCA, IPCC, HMEI, and other appropriate international organizations by agreement with the president, to participate in the work as appropriate.

Resolution 4 (CAeM-XIII)

REVIEW OF THE PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION FOR AERONAUTICAL METEOROLOGY

THE COMMISSION FOR AERONAUTICAL METEOROLOGY,

Considering that all resolutions other than Resolution 1 (CAeM-XII) adopted prior to its thirteenth session are now obsolete,

Considering that all recommendations adopted prior to its thirteenth session have been reconsidered by the Executive Council,

Noting the action taken on the recommendations adopted prior to its thirteenth session,

Decides:

- (1) To keep in force Resolution 1 (CAeM-XII);
 - (2) Not to keep in force Resolutions 2 (CAeM-XII), 3 (CAeM-XII) and 4 (CAeM-XII);
 - (3) Not to keep in force Recommendations 1 (CAeM-XII) and 2 (CAeM-XII).
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Resolution 5 (CAeM-XIII)

PARTICIPATION OF WOMEN IN THE WORK OF THE COMMISSION

THE COMMISSION FOR AERONAUTICAL METEOROLOGY,

Noting:

- (1) The United Nations Conference on Women (Beijing 1995) and its recognition of the importance of women and their contribution to science,
- (2) The appeals made in *Agenda 21: Programme for Action for Sustainable Development* (Rio de Janeiro, June 1992), Chapter 24: Global action for women towards sustainable and equitable development,
- (3) The Report of the Second WMO Conference on Women in Meteorology and Hydrology, Geneva, March 2003,
- (4) Resolution 33 of the Fourteenth World Meteorological Congress (Cg-XIV), which calls for equal opportunities for the participation of women in meteorology and hydrology,

Considering:

- (1) The need for trained, qualified professionals regardless of gender, in the work of the Commission,
- (2) The need to encourage national education programmes in science and technology that actively target girls and woman predisposing and training them to enter the fields of meteorology and related sciences,
- (3) The need to increase opportunities and inducements for the recruitment of women within NMHSs, and provide equal opportunities for career advancement to the highest levels,

Welcoming and supporting the active participation of women delegates in this Commission,

Urges increased participation and involvement of women in the work of this Commission;

Recommends that Members:

- (1) Continue to encourage, promote and facilitate equal opportunities for women in science and technology in order to prepare them for careers in scientific professions such as meteorology and related sciences;

- (2) Facilitate the participation of women in the activities of the Commission;
- (3) Provide active encouragement and support for equal opportunity for the participation of women in all fields of meteorology and related sciences at decision-making levels, particularly, in CAeM and its working programmes;

Further recommends that Members encourage the promotion of science studies in schools, as a means of ensuring the participation of women and men on an equal basis in this field of work;

Requests the president of the Commission to report to the fourteenth session of the Commission on progress made on the main aspects of the implementation of this resolution during the intersessional period,

Decides to appoint and support a gender focal point with appropriate expertise, who will report to the president of the Commission.

RECOMMENDATION ADOPTED BY THE SESSION

Recommendation 1 (CAeM-XIII)

REVIEW OF THE RESOLUTIONS OF THE EXECUTIVE COUNCIL BASED ON PREVIOUS RECOMMENDATIONS OF THE COMMISSION FOR AERONAUTICAL METEOROLOGY

THE COMMISSION FOR AERONAUTICAL METEOROLOGY,

Noting with satisfaction the action taken by the Executive Council on previous recommendations of the Commission for Aeronautical Meteorology,

Considering that many of these recommendations have become redundant in the meantime,

Recommends that Resolutions 9 (EC-LV), 10 (EC-LV) and 4 (EC-LVI) be no longer considered necessary.

ANNEXES

ANNEX I

Annex to paragraph 4.2.26 of the general summary

TERMS OF REFERENCE FOR THE TRUST FUND IN SUPPORT OF LDC MEMBERS TO ACCESS WAFS PRODUCTS

1. The purpose of the Trust Fund is to support the Commission for Aeronautical Meteorology (CAeM) in its efforts to assist Least Developed Country Members to ensure their NMHS has sustainable access to WAFS products by the most appropriate means;
2. The Trust Fund is within the provisions of Articles 9.7, 9.8 and 9.9 of the WMO Financial Regulations (2004 Edition);
3. The income of the Trust Fund includes:
 - (a) Voluntary contributions from Members;
 - (b) Voluntary contributions made for specific purposes;
 - (c) Contributions from other donors;
 - (d) Interest on investments of the Trust Fund as may be made in accordance with the provisions of Financial Regulation 12.2;
4. Contributions to the Fund should be made in Swiss Francs or any other convertible currency;
5. The Fund will be used to:

Assist Least Developed Country Members, to meet the target date of 31 December 2008 for the replacement of first generation SADIS and ISCS installations, where all other reasonable means have been demonstrably exhausted, and thereby to ensure sustainable access to WAFS products by the most appropriate means, in conformance with ICAO provisions, that could include:

 - (i) The purchase of specified items of equipment and software to facilitate access to WAFS products;
 - (ii) Payment for the services of consultants to assist in solving problems related to acquisition, installation and operation of such equipment and software; and,
 - (iii) Support to training activities related to sustainable operation of such equipment and software, access and delivery of WAFS products;
6. The Secretary-General of the WMO or his authorized representative shall be responsible for the management of contributions and disbursements and the general administration of the Fund in accordance with the Financial Regulations and Rules, Standing Instructions and established procedures of the WMO;
7. Authority for the disbursement of funds, in respect of contracts and agreements properly concluded, will be delegated to the president of CAeM, together with the Secretary-General of WMO, or his representative;

8. Where required by their internal regulations, individual contributors to the Trust Fund may wish to negotiate additional conditions governing the application, conditions of deposit and disbursement of funds. However, such additional conditions shall not inhibit the efficient and proper use of the Fund nor modify its intent and shall require the acceptance in writing by the Secretary-General of WMO or his representative;
9. The Secretary-General of the WMO shall ensure that the level of the Trust Fund is sufficient to cover any unliquidated obligations and expected expenses before accepting new obligations to the Fund;
10. Upon liquidation of the Fund for any reason, the Secretary-General of WMO shall make provision for the payment of unliquidated obligations and estimated expenses of winding-up business;
11. Following the closure of the Fund any remaining surplus after liquidation of the Fund shall be transferred to WMO general accounts unless otherwise agreed between the contributors. In the event of a decision to distribute the surplus, it shall be effected among the contributors to the Fund in proportion to their contributions against the total accumulated contributions to the Trust Fund, save in the case of earmarked contributions, which shall be reimbursed to the contributor after the liquidation of any outstanding obligation;
12. Financial Reports on the Trust Fund will be made in Swiss Francs. The United Nations rate of exchange prevailing on the date of any transaction or report will apply for the conversion into Swiss Francs of contribution or income received, and payments made or charges incurred in any other currency. WMO shall submit every year a Financial Report to the Executive Council and Trust Fund contributors, as well as to each session of the CAeM, on the overall use of the Fund. The statement of income and expenditure of the Fund will be incorporated in the overall financial statements submitted by the Secretary-General of WMO to the WMO Executive Council for approval. External audit will be conducted as provided for in the WMO Financial Regulations. The audit report will be available to Trust Fund contributors on request.

ANNEX II

Annex to paragraph 5.4 of the general summary

LIST OF TRAINING EVENTS AND ACTIVITIES

- (a) A very successful AMDAR information and training session was held from 19 to 21 November 2002 in Dakar hosted by ASECNA and was attended by 20 participants. The AMDAR Panel, with support from EUMETNET-AMDAR (E-AMDAR) presented, among others, the already available data from targeted European aircraft on routes to and from airports in the ASECNA region;
- (b) The Training Workshop on Aeronautical Meteorology with Emphasis on Radar and Satellite Products Interpretation and NWP Application to Aviation kindly hosted by Canada, in Toronto, in October 2003, was attended by 35 participants from 33 countries from all WMO Regions. Mr Carr McLeod, the vice-president of CAeM, Mr H. Puempel (Austria) and Ms S.Y. Lau (Hong Kong, China), the co-chairs of OPAG TREND, assisted by the Secretariat, played a major role in identifying 15 suitable lecturers and in coordinating the delivery of lectures during the event. In addition, Mr Puempel and Ms Lau prepared and presented their own lectures. All lectures presented at this Workshop have been posted on the AeMP

Website, made available in electronic form and sent to all participants in January 2004 by the Secretariat;

- (c) The Seminar on Cost Recovery and Administration kindly hosted by Tonga in Vava'u, in December 2003, was attended by 19 participants from 16 countries from Region V. Mr N. Gordon, the president of CAeM, was one of the lecturers at this seminar. His lecture entitled "Cost Recovery for Aeronautical Meteorological Services" is available on the AeMP Website;
- (d) The Cost Recovery Workshop on Aeronautical Meteorological Service in the Eastern part of the European Region kindly hosted by the Russian Federation in Moscow in November 2003 and organized by ICAO in coordination with WMO was attended by 52 participants from 21 countries;
- (e) As a result of close collaboration between ICAO, France and WMO, the Third Volcanic Ash Workshop was held in Toulouse (France), in October 2003. The report of this workshop has been posted on the AeMP Website;
- (f) The AMDAR workshop kindly hosted by the United Arab Emirates in Dubai in May 2004 was attended by 22 participants from RA V including representatives of meteorological centers and air line companies;
- (g) The second international conference on Volcanic Ash and Aviation Safety organized by USA and co-sponsored by WMO was held in Washington in June 2004. The USA, in collaboration with WMO, provided financial support to 10 participants from 10 countries in Regions III, IV and VI;
- (h) The UK/WMO Aviation seminar held in Exeter, UK in June/July 2004 covered the transition to BUFR code for SADIS workstation, aviation forecasting and the identification of aviation training needs. Twenty-three delegates from Africa, Europe, the Middle East and Asia attended the Seminar;
- (i) The AMDAR Workshop kindly hosted by China in Beijing in October 2004 was attended by 19 participants;
- (j) Twenty-eight participants from 10 English-speaking countries from Africa attended the ICAO/WMO Regional Seminar on Cost Recovery held in Nairobi, (Kenya) in November 2004. ICAO and WMO provided lecturers;
- (k) Mr N.T. Diallo presented a lecture on Aeronautical Meteorology issues at the WMO Seventh Technical Conference on Management for Development of NMSs in Africa held in Brazzaville, Congo in November 2004 attended by 55 participants from 52 countries;
- (l) The AMDAR Workshop for Eastern EUR Countries kindly hosted by Hungary in Budapest, in December 2004 was attended by 16 participants;
- (m) The ASECNA Training Seminar on Amendment 73 to ICAO Annex 3/WMO Technical Regulations [C.3.1] held in Niamey, (Niger) in March 2005 was attended by 27 participants from 16 French-speaking African countries and 3 International Organizations. Lecturers for the seminar included Mr H. Cissé from ICAO, Mr Benoit A. Okossi and Mr Ilboudo Goama both from ASECNA and Mr S. Benarafa from WMO;
- (n) The UK/WMO Aviation Seminar held in Exeter, UK in June 2005 was attended by 20 participants from 18 countries;
- (o) The World Weather Research Programme's Symposium on nowcasting and very short range forecasting back to back with the Workshop on Value Added Services for Air

Navigation and User Oriented Aerodrome Forecasts, held in Toulouse, (France), in September 2005 was attended by 51 experts from 33 countries; and,

- (p) The WMO/ICAO Seminar on Quality Management in the provision of MET services to aviation was kindly hosted by Hong Kong, China in November 2005 to assist States/Members to comply with Recommendations 2.2.2 to 2.2.6 of ICAO Annex 3/WMO Technical Regulations [C.3.1] that called on States/Members respectively “to ensure that the designated Meteorological Authority establishes and implements a properly organized quality system”. Sixty-two participants from 38 countries and ICAO attended. WMO provided funding support to all of the 32 candidates who requested such support. Lecturers included Ms Sharon S.Y. Lau, Ms Isabelle Rüedi, Mr Carr McLeod, Mr Bryan Boase, and Mr Saad Benarafa.

ANNEX III

Annex to paragraph 9.10 of the general summary

PLAN FOR AeMP 2008–2011

Purpose and scope

The purpose of the Aeronautical Meteorology Programme (AeMP) is to assist Members, through an internationally coordinated Programme in their efforts to further the application of meteorology to meet the evolving needs of aviation. The scope of the Programme, in the framework of WMO’s role of facilitating international coordination and cooperation, covers improvements to the provision of operational meteorological information required by the aviation industry (including the requirements specified by Technical Regulations [C.3.1]) to ensure the safety, regularity and efficiency of air navigation, and to the provision of meteorological assistance and expertise to non-real time aviation activities.

This programme will directly contribute to WMO’s Top Level Objective 1, (“To produce more accurate, timely and reliable forecasts and warnings of weather, climate, water, and related environmental elements”), and Top Level Objective 2 (“To improve the delivery of weather, climate, water, and related environmental information and services to the public, governments and other users”).

The programme contributes to the following Expected Results as contained in the WMO Strategic Plan:

- Expected Result 1: Enhanced capabilities of Members to produce better weather forecasts and warnings;
- Expected Result 6: Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness;
- Expected Result 7: Enhanced capabilities of Members to provide and use weather, climate, water and environmental applications and services;
- Expected Result 8: Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations;
- Expected Result 9: Enhanced capabilities of Members in developing countries, particularly Least Developed Countries, to fulfil their mandates.

Main long-term objective

The main long-term objective of the AeMP is to ensure the worldwide, reliable provision of good quality, timely, cost-effective, sustainable and responsive meteorological service to users throughout the world in support of safe, regular and efficient aviation operations.

Implementation activities 2008–2011

The implementation of the programme includes the following activities:

(a) Provide access to training

Activities will include:

- Secretariat organization and facilitation of training events;
- Provision where feasible of training materials in multiple languages;
- Provision of expertise to conduct training;
- Provision of reviewed training and resource material on the <http://www.caem.wmo.int> Website;
- Publication of guidance.

The main focus of the training will be twofold. In terms of operational aeronautical training, it will include:

- Promoting compliance with the Aeronautical Supplement to WMO-No. 258;
- Guidance on the use and interpretation of existing and developing nowcasting and short-range forecasting techniques and systems for the diagnosis and assessment of aviation impact variables;
- Any required training dealing with new products and services including changes to WAFS products.

In relation to non-operational matters, it will include best practice examples and resource material on such topics as:

- Quality Management Systems;
- Forecast Verification;
- Development of New Services to Aviation;
- Change Management.

(b) Facilitate good relationships and collaboration between Members and their customers and partners including Civil Aviation Administrations and other Air Navigation Service Providers

Activities will include:

- Secretariat conducting joint missions with ICAO in cases of difficult relationships over cost recovery matters;
- Assembling and making available information on economic benefits of aeronautical meteorology, e.g. from case studies;
- Assembling and making available information on evaluation of aeronautical meteorological products and services;
- Providing best practice examples of consultation mechanisms;
- Providing user information and promotion resources;
- Preparing and updating guidance material in relation to cost recovery;

- Assisting Members to explain to civil aviation administrations the fair and reasonable basis for aeronautical meteorology charges;
- Facilitating access to expertise for advice (“helpline”).

(c) Assist Members in planning for future aviation met services

Activities will include:

- Providing information on the evolving needs of “Global ATM” (formerly CNS/ATM) of ICAO and potential impacts;
- Providing information on evolving institutional and technological forms of aviation meteorological service provision in other countries and regions (e.g., Single European Sky/SESAR, NGATS, FlySafe) and the potential impacts of such developments;
- Providing information on value-added services being provided or planned in other Members and the revenue generated by such services;
- Providing information on the impacts of aviation on the environment and the potential impacts of climate change on aviation;
- Facilitating access to expertise for advice.

(d) Collaborate with ICAO on the design and assessment of a new terminal weather forecast

Activities will include:

- Assessing current initiatives and previous work in this field, including that under the ICAO METG in Europe and the results of the WMO International Symposium on Nowcasting, Very Short-Range Forecasting and TAF Verification (Toulouse, France, 5-10 September 2005);
- Collaborating with ICAO on evolving user requirements and a potential new terminal weather forecast, with a view to world-wide adoption in 2014;
- Prototyping and assessing a new terminal weather forecast in terms of expected user benefits and facilitation of performance assessment.

(e) Ensure aeronautical meteorology interests are taken into account and capabilities made available in cross-cutting activities and other constituent bodies of WMO

Activities will include involvement in cross-cutting activities including:

- Quality Management Systems;
- Least Developed Country Programme;
- Natural Disaster Prevention and Mitigation Programme;
- ETAC - Expert Team on Accreditation and Certification in Meteorological Education and Training;
- THORPEX (CAS);
- IPY;
- GEOSS (CBS);
- AMDAR (migrating to CBS);
- Observations (CBS, CIMO);
- Space Programme (CBS);
- WIS (CBS);
- Codes (CBS);
- Website (Secretariat);
- IPCC;
- Gender Issues;
- Regional Programme;
- Other interactions with technical commissions.

(f) Ensure that WMO Members' interests are represented in ICAO regional planning, study and operations groups

Activities will include:

- Having WMO Secretariat representation and active participation on appropriate groups;
- Advising the WMO Secretariat on issues in relation to ICAO matters;
- Providing where necessary a Commission advisor to assist the Secretariat representative (e.g., ANSEP, CAEP).

(g) Survey Members' capabilities for aeronautical meteorological service provision with a view to identify and quantify benefits from the AeMP

Surveys will be conducted at least once every two years, in order to:

- Assess progress on the delivery of services;
- Assess progress on the implementation of QMS, etc.;
- Assess existing training activities in order to better target education and training support.

ANNEX IV
Annex to agenda item 13 of the general summary

TERMS OF REFERENCE OF THE CAeM GENDER FOCAL POINT

1. To gather and analyse details as required, of the role of women and men in the work of the Commission;
 2. To liaise with the WMO Gender Focal Point and to jointly collect and disseminate information including studies and policies on the role of women in areas relevant to the Commission;
 3. To collaborate with gender focal points in other technical commissions;
 4. To explore, document and make recommendations for addressing the need for capacity building in gender mainstreaming in each region, pertinent to the commission; and
 5. To submit reports in accordance with the requirements of the CAeM Management Group.
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APPENDIX

LIST OF PARTICIPANTS

1. Officers of the session

President	N.D. Gordon (New Zealand)
Vice-President	C. McLeod (Canada)

2. Representatives of WMO Members

Algeria

H. Latrous	Delegate
H. Mehadji	Delegate

Argentina

M. Romain (Ms)	Delegate
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Australia

G. Moynihan	Principal Delegate
S. Lawrence (Ms)	Delegate
J. Caust	Delegate

Austria

R. Lenger	Observer
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Bahamas

B. Dean	Principal Delegate
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Bahrain

A.A.A. Habib	Principal Delegate
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Belgium

N. De Keyser (Ms)	Principal Delegate
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Bosnia and Herzegovina

G. Mutabdzija	Principal Delegate
A. Kundurovic (Ms)	Delegate

Brazil

C.R. Henriques	Principal Delegate
M. Matschinske	Delegate

Canada

C. McLeod	Principal Delegate
J. Footitt	Delegate
K. Johnson	Delegate

China

Xu Xiaofeng	Principal Delegate
Jiao Meiyang (Ms)	Delegate
Tao Liying (Ms)	Delegate
Zhuang Weifang	Delegate
Zhang Yuetang	Delegate
Chen Weihong (Ms)	Delegate
Xu Jianliang	Delegate

Colombia	
O. Bermúdez G.	Principal Delegate
Côte d'Ivoire	
N'gbe Abole	Principal Delegate
Croatia	
I. Čačić	Principal Delegate
B. Gelo (Ms)	Delegate
Cuba	
J. Ayón Alonso	Principal Delegate
Denmark	
S.E. Olufsen	Principal Delegate
Egypt	
M.N.M. Salah El-Din	Principal Delegate
H.M. Abdel-Aziz Helal	Alternate
Estonia	
O. Gusseva (Ms)	Delegate
Ethiopia	
D. Shanko	Principal Delegate
Finland	
H. Juntti	Principal Delegate
K. Österberg	Delegate
France	
D. Lambergeon	Principal Delegate
M.-C. Queffelec (Ms)	Delegate
Gambia	
L.M. Touray	Principal Delegate
Germany	
K. Sturm	Principal Delegate
Ghana	
P. Ayilari-Naa Juati	Principal Delegate
Greece	
S. Kyriakou (Ms)	Delegate
Haiti	
R. Semelfort	Observer
Hong Kong, China	
SHUN Chi-ming	Principal Delegate
Lau Sum-yee S. (Ms)	Delegate
Hungary	
V.F. Sándor (Ms)	Principal Delegate

Iceland	T.F. Hervarsson U. Ólafsdóttir (Ms)	Principal Delegate Observer
India	A.B. Mazumdar	Principal Delegate
Iran, Islamic Republic of	A.M. Noorian J.M. Mahzooni	Principal Delegate Delegate
Ireland	D. Murphy	Principal Delegate
Israel	R. Yinnon (Ms)	Principal Delegate
Italy	M. Ferri S. Fiacconi	Principal Delegate Delegate
Japan	H. Goda S. Nakazawa	Principal Delegate Delegate
Kazakhstan	S. Kozhametov	Principal Delegate
Kenya	V.O. Ahago	Principal Delegate
Kyrgystan	G. Lee (Ms)	Delegate
Latvia	A. Kajevčenko (Ms) A. Žilina (Ms)	Principal Delegate Observer
Macao, China	A. Viseu	Principal Delegate
Malaysia	C.G. Ismail	Principal Delegate
Mauritius	<i>Y. Boodhoo</i>	Principal <i>Delegate</i>
Netherlands	D. Hart K. Blom	Principal Delegate Delegate
New Zealand	N. Gordon	Principal Delegate

Nigeria

T. Obidike	Principal Delegate
D.B. Eyoh	Delegate
E.A. Afiesimana	Delegate
F.O. Ikekhua	Delegate
M.O. Iso (Ms)	Delegate

Norway

A. Heidegård	Principal Delegate
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Oman

B. Alrumhi	Principal Delegate
M.S. Al-Mashani	Delegate

Peru

V. Caballero Laca	Principal Delegate
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Poland

R. Klejnowski	Principal Delegate
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Portugal

J. Barradas	Principal Delegate
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Republic of Korea

Sang-jo KIM	Principal Delegate
Il-kyu Yang	Delegate
Jin-seok Park	Delegate

Romania

D. Vişoiu	Principal Delegate
I. Sandu	Alternate
M. Baicu (Ms)	Delegate
C. Virlan (Ms)	Delegate

Russian Federation

A. Polyakov	Principal Delegate
N. Zharova	Delegate
A. Lokot	Delegate

Rwanda

L. Kanobayire	Principal Delegate
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Senegal

M.Y. Thiam	Principal Delegate
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Serbia

P. Petkovic	Principal Delegate
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Seychelles

W. Agricole	Principal Delegate
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Slovakia

C. Kunzo	Delegate
I. Hacisek	Delegate

South Africa

G.E. Khambule (Ms)	Principal Delegate
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Spain

V. Conde (Ms)	Principal Delegate
F. Sterling	Delegate

Sweden

G. Carlson	Principal Delegate
D. Carlberg	Alternate

Switzerland

P. Eckert	Principal Delegate
D. Cattani	Alternate
O. Duding	Delegate

Syrian Arab Republic

K. Archeed	Principal Delegate
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The former Yugoslav Republic of Macedonia

D. Mijatovic (Ms)	Delegate
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Togo

A.A. Egbare	Principal Delegate
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Trinidad and Tobago

S. Baig	Principal Delegate
D. Gajadhar	Delegate

Uganda

V.K.R. Baryomu	Principal Delegate
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Ukraine

T. Antonenko (Ms)	Delegate
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United Kingdom of Great Britain and Northern Ireland

D. Underwood	Principal Delegate
D. Johnson	Alternate
I. Lisk	Delegate

United Republic of Tanzania

S.M. Sillayo	Principal Delegate
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United States of America

M. Andrews	Principal Delegate
K.L. Johnston	Alternate
J. May	Delegate
M. Mercer	Delegate
D. Pace	Delegate

Venezuela

R.C. Velásquez	Principal Delegate
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Zimbabwe

B. Berejena	Alternate
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3. Non-Members

Palestine

I. Musa
O. Mohammed

4. Representatives of International Organizations

Agency for Air Safety in Africa and Madagascar (ASECNA)

A.B. Okossi
S. Zoumara

Association of Hydro-Meteorological Equipment Industry (HMEI)

B. Sumner
C. Charstone (Ms)
H. Katajamäki
J. Polivinen

International Atomic Energy Agency (IAEA)

R.M. Mazzanti (Ms)

International Civil Aviation Organization (ICAO)

O. Turpeinen

International Federation of Air Line Pilots' Associations (IFALPA)

H. Fournerat

5. Other Participants

WMO AMDAR Panel

F. Grooters
M. Berechree

Airbus

A. Corbière

6. Invited expert/Lecturer

R. Petersen, University of Wisconsin, USA

7. WMO Secretariat

M. Jarraud	Secretary-General
Hong Yan	Deputy Secretary-General
D. Schiessl	Director, Cross-Cutting Coordination (CCC)
H. Puempel	Chief, Aeronautical Meteorology Unit, APP
N.T. Diallo	AEM Consultant, APP
F. Hayes	Conference Officer
