



**Third Meeting on GREPECAS MET Programme Projects**

(Lima, Peru, from 17 to 20 June 2019)

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**Agenda Item 8: Other business**

**WMO ACTIVITIES IN AERONAUTICAL METEOROLOGY OF RELEVANCE TO ICAO**

(Presented by the World Meteorological Organization (WMO))

**SUMMARY**

The information paper provides an overview of some of the relevant recent and upcoming activities of WMO in the context of aeronautical meteorology, including the outcomes of the Sixteenth Session of the Commission for Aeronautical Meteorology (CAeM-16) and its Technical Conference, WMO Regional Association session, WMO's contribution to global and regional initiatives in aeronautical meteorology including those of ICAO, and expected outcomes of the Eighteenth World Meteorological Congress (Cg-18).

Action by the meeting is in paragraph 3.

**1. Introduction**

1.1 ICAO and the World Meteorological Organization (WMO) coordinate, collaborate and cooperate on international standards for aeronautical meteorological service provision, as contained in ICAO Annex 3/WMO Technical Regulations (WMO-No. 49), Volume II, *Meteorological Service for International Air Navigation* and supporting ICAO and WMO guidance material.

1.2 During the intersessional period, WMO has continued to play an active role in supporting its Members and partners including ICAO in the establishment, maintenance and implementation of these international standards.

1.3 This information paper provides an overview of some of the relevant recent and upcoming activities of WMO in the context of aeronautical meteorology.

**2. Discussion**

***Outcomes of CAeM-16 session and TECO***

2.1 The Sixteenth Session of the WMO Commission for Aeronautical Meteorology (CAeM-16) was held in Exeter, United Kingdom from 24 to 27 July 2018. The session was preceded by a one-day Technical Conference on 23 July 2018 titled "*The future is now: Meteorology enabling aviation decision support*". Several side events were also conducted during the CAeM-16 session.

2.2 The CAeM-16 session and TECO was attended by over 130 delegates from more than 50 countries and 8 international organizations and other bodies.

2.3 The CAeM-16 session and TECO addressed an array of aeronautical meteorology topics of relevance to WMO Members and partners including matters pertaining to the recent and upcoming activities and working structure of the CAeM, cooperation on aeronautical meteorology issues across WMO programmes and with international organizations including ICAO and the International Air Transport Association (IATA), strategic and operating plans of WMO, long-term planning for aeronautical meteorology, and the implications on CAeM of a proposed reform of WMO constituent bodies.

2.4 The session formulated a total of 6 resolutions, 6 decisions and 7 recommendations. Included in these outcomes was the election of a new president and vice-president of the Commission – namely Mr. Ian Lisk (UK) as president of CAeM and Ms. Stéphanie Desbios (France) as vice-president of CAeM – as well as the following priority themes for the next intersessional period:

- Education, training and competency;
- Information services and governance;
- Hazards science;
- Climate change and variability impacts on aviation; and
- Communication and outreach.

2.5 The CAeM has now aligned its subsidiary structures (expert team and expert networks) and their work plans with the foregoing five priority themes. Information in this regard is [available here](#).

2.6 The abridged final report (Part I) and progress report (Part II) of the CAeM-16 session were published as WMO Publication No. 1222 [available here](#) via the WMO e-Library. Alternatively, directly access the language versions here:

- Part I (all languages): [English](#), [French](#), [Spanish](#), [Russian](#), [Chinese](#), [Arabic](#)
- Part II (English only): [English](#)

2.7 Presentation materials of the TECO are [available here](#) while presentations given during CAeM-16 side events are [available here](#).

### ***Outcomes of WMO RA III-17 session***

2.8 The Seventeenth Session of the WMO Regional Association III (South America) (RA III-17) was held in Santiago, Chile from 21 to 23 November 2018. The session was preceded by a Regional Conference (RECO) on 19 and 20 November 2018.

2.9 The RA III-17 session addressed an array of issues of relevance to the region including RA III strategic priorities and emerging issues in weather, climate and water, capacity development, partnerships and governance reform.

2.10 In respect of aeronautical meteorology, the session formulated:

- Resolution 3 (RA III-17) concerning scientific research and development which, inter alia, urged members to apply the outcomes of a WMO 2017 Aeronautical Meteorology Scientific Conference (paragraph 2.19 below and [AeM SERIES No. 2](#) refer)

- Resolution 4 (RA III-17) concerning the global and regional landscape of aeronautical meteorological service provision which, inter alia, urged Members to analyze the outcomes of a 2016/2017 CAeM global survey (paragraph 2.23 below and [AeM SERIES No. 1](#) refer)
- Decision 12 (RA III-17) concerning an alignment of aeronautical meteorology-related activities and priorities in the region with the outcomes of the CAeM-16 session and TECO (referenced at 2.1 above)

2.11 The abridged final report (Part I) and progress report (Part II) of the RA III-17 session were published as WMO Publication No. 1228 [available here](#) via the WMO e-Library. Alternatively, directly access the language versions here:

- Part I: [English](#) and [Spanish](#)
- Part II: [English/Spanish](#)

***WMO contribution to global initiatives (non-exhaustive)***

2.12 WMO continues to play an active role in the activities of the ICAO Meteorology Panel (METP) and its five working groups (WG-MRI, WG-MISD, WG-MIE, WG-MOG and WG-MCRGG) addressing an array of topics including but not limited to:

- Air traffic management requirements for MET information services;
- Updates to the ICAO Global Air Navigation Plan (ASBU) and its aviation system block upgrades (ASBU) methodology in respect of MET;
- Restructuring of ICAO Annex 3 and (re)introduction of PANS-MET;
- Service requirements as well as scientific and/or technological capabilities in respect of:
  - Releases of radioactive material into the atmosphere (RRM);
  - Regional hazardous weather advisory concept (RHWAC);
  - Space weather (SWx) information service;
  - Volcanic ash and sulphur dioxide (VASD);
  - ICAO meteorological information exchange model (IWXXM); and
  - MET in SWIM (system-wide information management);
- Operation and development of global MET systems including:
  - International airways volcano watch (IAVW);
  - World area forecast system (WAFS); and
  - Secure aviation data information system (SADIS) and WAFS internet file service (WIFS);
- Cost recovery and governance guidance including issues associated with ‘meteorological authority’ and data management/access policies.

2.13 In addition, WMO actively contributes to the ICAO Airport Economics Panel and Air Navigation Services Economics Panel (AEP-ANSEP) on matters that include charges for and cost recovery of aeronautical meteorological service provision. This is an important WMO-ICAO link given national, regional and global arrangements that currently exist and/or that will be required to fulfill the demands of ICAO’s GANP/ASBU while at the same time respecting ICAO’s four key charging principles of non-discrimination, cost-relatedness, transparency and user consultation.

2.14 WMO also actively contributes to the IATA Flight Operations Support Task Force (FOSTF) and Accident Classification Technical Group (ACTG). In respect of the activities of the ACTG, WMO has been a key contributor to the preparation of the annual IATA Safety Report – the 2018 report is [available here](#) – which provides an in-depth review and essential insight into global and regional accident rates and

contributing factors, including those relating to weather/meteorological conditions and/or the unnecessary penetration by flight crew into adverse weather/meteorological conditions.

2.15 In addition, WMO continues to work with IATA on a proposed formulation of arrangements and programmatic structures in which they will potentially collaborate on the future expansion and enhancement of the AMDAR (Aircraft Meteorological Data Relay) programme.

2.16 A WMO Task Team on the IATA-WMO Collaboration on AMDAR (TT-IWCA) has been established to coordinate, together with IATA, the further refinement and finalisation of a concept of operations, terms of reference and an implementation plan for the WMO-IATA Collaborative AMDAR Programme (WICAP) in time for consideration at WMO Congress in June 2019. The WICAP will have the primary aim to expand and enhance the AMDAR programme, particularly in data-sparse areas and with extension of the coverage of turbulence and water vapour measurement.

2.17 Based on meeting requirements for a minimal global coverage, this WMO-IATA collaboration would be expected to lead to at least a doubling of the current airline participation of 40 airlines over the medium to longer term.

#### ***WMO contribution to regional initiatives (non-exhaustive)***

2.18 Where resources allow, WMO plays an active role in supporting Members/States in aeronautical meteorology-related activities at a regional level. Of late, these activities have included enhancing the provision of SIGMET information by meteorological watch offices (MWO) through the establishment of bilateral and/or multilateral SIGMET coordination arrangements as well as updates to regional SIGMET guides through the identification of best practices, and support to the implementation of quality management systems (QMS) and conformity with the ISO 9001:2015 standard through twinning/mentoring arrangements and other associated capacity development. In addition, WMO has provided capacity development in other areas such as the implementation of the IWXXM schema and the competency and qualification of personnel providing meteorological service for international air navigation.

#### ***Other relevant developments/initiatives***

2.19 **AeroMetSci-2017:** In November 2017, WMO and partners conducted an Aeronautical Meteorology Scientific Conference (AeroMetSci-2017) in Toulouse, France with the theme “*Aviation, weather and climate: Scientific research and development for future aeronautical meteorological services in a changing atmospheric environment*”. The conference provided a forum for representatives of the scientific research community (including research institutes, universities and other academia), aeronautical meteorological service providers (public and private sector), aviation users and industry to discuss the need for and strategic direction of meteorological scientific and technological advancement in support of current and future air transport needs. The conference attracted more than 200 delegates. The conference provided an overview on the current state-of-the-art and the foreseen advances in meteorological science and technology, and the expectations for faster transfer of these advances into operations in the form of fit-for-purpose services for aviation end-users. The conference formulated recommendations and a statement which were subsequently endorsed by WMO constituent bodies. The report on the conference (published by WMO as AeM SERIES No. 2) and all presentation materials are [available here](#).

2.20 **Aviation Research and Development Project (AvRDP):** The WMO Commission for Atmospheric Sciences (CAS), Commission for Basic Systems (CBS) and CAeM continue to progress an Aviation Research and Development Project (AvRDP) aimed at demonstrating the capability of nowcasting and mesoscale meteorological modelling techniques in support of evolving needs of aviation over the

coming years as conveyed in ICAO's Global Air Navigation Plan (GANP) and its aviation system block upgrades (ASBU) methodology.

2.21 AvRDP is transitioning to a Phase II 'MET-ATM impact translation and validation' and new airports are joining/have joined the project.

2.22 **CAeM global surveys:** In 2016/2017, the CAeM conducted a global survey with Members/States on aeronautical meteorological service provision. More specifically, the survey sought to establish a comprehensive, consolidated global view on the existing institutional arrangements for the provision of meteorological services to international air navigation, particularly at a national level, taking into account the supporting WMO and ICAO regulatory frameworks. The outcomes of the survey were reported to WMO constituent bodies and other concerned including ICAO. The report on the 2016/2017 CAeM global survey was published by WMO as AeM SERIES No. 1 [available here](#).

2.23 In early 2019, the CAeM conducted another global survey with Members/States in the form of a sensitivity analysis of future meteorological service delivery to aviation. The outcomes of the survey are expected to be published by WMO later in 2019 as part of the AeM SERIES of publications.

2.24 **Long-term plan for aeronautical meteorology:** In response to requests by WMO constituent bodies, the CAeM has recently developed a long-term plan for aeronautical meteorology. The long-term plan provides a framework upon which aeronautical meteorological service providers of Members/States in particular, and the broader meteorology and aviation communities in general, can plan a progressive transformation from a conventional "product-centric" approach to a modern "information-centric" approach to service provision for aviation through to 2030 and beyond.

2.25 The long-term plan pays due regard to sector-wide air transport progress envisaged over the coming decade or more and is complementary to the ICAO GANP. This complementarity is necessary to ensure that as ICAO's vision for a globally interoperable, harmonized air traffic management system of the future becomes fully realized developments on the WMO side can and will occur in unison.

2.26 The long-term plan offers a long-term vision, a rolling strategy that will assist WMO, its Members and partners ensure that aeronautical meteorological service provision evolves in a manner that harnesses scientific and technological advancement, both on the service providers' side and the aeronautical users' side. The long-term plan is [available here](#) in English only.

2.27 **Communication and outreach:** The CAeM issues biannual newsletters to bring the community up-to-date on the latest and upcoming developments in aeronautical meteorology, including those of WMO and its partners such as ICAO. The March 2019 issuance of the newsletter is [available here](#). Anyone wishing to subscribe (for free) to future newsletters is invited to email a request to: [aviation@wmo.int](mailto:aviation@wmo.int)

2.28 Also, WMO maintains a publicly-accessible website in aeronautical meteorology – [available here](#). The website provides a 'one-stop shop' for all materials relating to, *inter alia*, the Aeronautical Meteorology Programme (AeMP) and the CAeM including its subsidiary bodies.

2.29 The newsletters and the website are just some of the ways WMO looks to keep the aeronautical meteorology community informed of the latest and upcoming developments.

2.30 **Expected outcomes of Cg-18:** The Eighteenth World Meteorological Congress (Cg-18) will be conducted by WMO from 3 to 14 June 2019 in Geneva, Switzerland. Congress convenes typically once every four years. This year, Congress will discuss matters including but not limited to:

- WMO strategic plan, operating plan and results-based budget for 2020 to 2023;
- Governance review including a reform of WMO's constituent bodies;
- Weather, climate, hydrological and related environmental services, including aeronautical meteorological services;
- Earth system observations and predictions, including the WMO Integrated Global Observing System (WIGOS), WMO Information System (WIS) and WMO Global Data-processing and Forecasting System (GDPFS);
- Earth system research;
- Capacity Development; and
- Policy and other related matters.

2.31 In respect of aeronautical meteorological services referenced above, Congress is expected to endorse the recommendations emanating from the CAeM-16 session as well as the long-term plan for aeronautical meteorology.

2.32 In respect of the governance review referenced above, it is worthwhile to note that, subject to endorsement by Congress, WMO will undertake a major reform of its constituent bodies in the 2019-2020 timeframe. This reform will include but not be limited to a restructuring (consolidation and repurposing) of technical commissions including CAeM, Commission for Basic Systems (CBS), Commission for Instruments and Methods of Observation (CIMO) and Commission for Atmospheric Sciences (CAS) as well as an alignment of the WMO secretariat with the new WMO organizational structure. It is expected that CAeM will be dissolved after Congress and that a new (non-intergovernmental) Standing Committee on Aeronautical Meteorology [working title] will be established under a new (intergovernmental) Commission for Services and Applications [working title].

2.33 All information pertaining to Congress, including working documentation, is [available here](#).

2.34 The report on Cg-18 will be published by WMO late in 2019 or early 2020 and will be available via the e-Library [here](#).

### **3. Action by the meeting**

3.1 The meeting is invited to note the information contained in this paper.