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ICAO

INFORMATION PAPER

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Agenda Item 6: Research, development and other initiatives

WMO ACTIVITIES OF RELEVANCE TO ICAO

(Presented by the World Meteorological Organization, WMO)

SUMMARY

This information paper provides an overview of some of the recent activities of the World Meteorological Organization (WMO) of relevance to ICAO, particularly in the context of WMO's latest organization structures, engagement with ICAO and other agencies at the global and regional levels, recent and upcoming events, and other noteworthy information including links to WMO resources.

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. Where resources allow, WMO continues to play an active role in supporting its Members and partners including ICAO in the establishment, maintenance and implementation of these international standards.

1.2 This information paper provides an overview of some of the recent activities of WMO of relevance to ICAO, particularly in the context of WMO's latest organization structures, engagement with ICAO and other agencies at the global and regional levels, recent and upcoming events, and other noteworthy information including links to WMO resources.

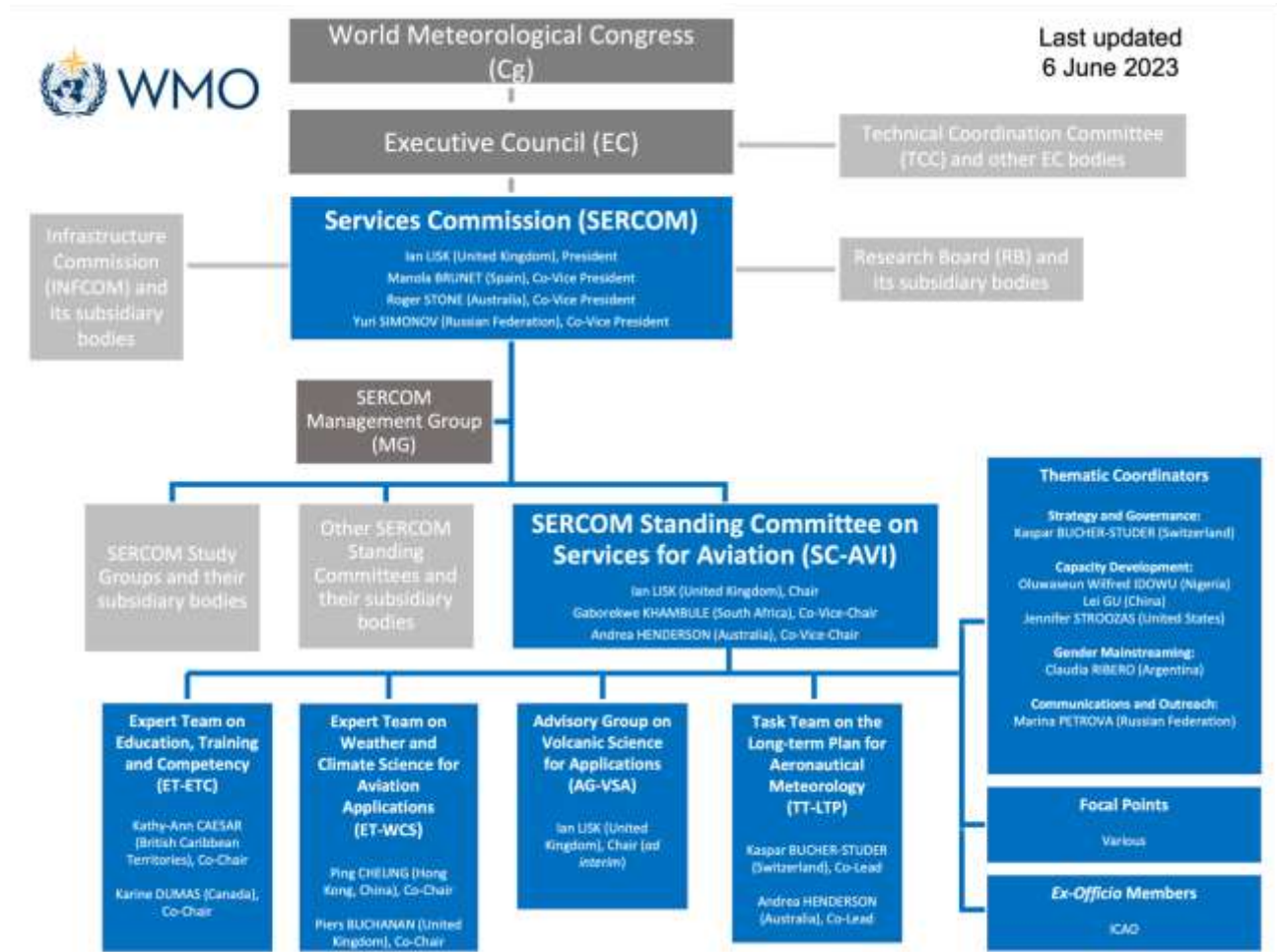
2. DISCUSSION

2.1 *Latest organization structure in the WMO Services for Aviation activity area*

2.1.1 As reported at recent METSG meetings (through [METSG24/IP-17](#), [METSG/25-IP/16](#) and [METSG/26-IP/02](#)), in 2019 WMO embarked on a major reform of its governance structures. This reform has, to the greatest extent, now been completed in the prevailing eighteenth financial period of WMO, 2020-2023. As part of the reform, a *non-governmental* Standing Committee on Services for

Aviation (SC-AVI) was established under an *intergovernmental* Commission for Weather, Climate, Water and Related Environmental Services and Applications (abbreviated to ‘Services Commission’ or SERCOM). SC-AVI comprises approximately 15 experts, with representation from across all six WMO Regions. Its primary purpose is to contribute to furthering the standardized provision of meteorological services for international air navigation and to provide assistance to Members with aeronautical meteorological services to achieve compliance with those standards. ICAO is an ex-officio member of SC-AVI and, as such, is a key collaborator in all the Standing Committee’s activities.

2.1.2 An illustration of the latest WMO organizational structure as it relates to SC-AVI is as follows:



2.1.3 As the foregoing graphic illustrates (bottom row), SC-AVI is currently supported by two expert teams (ET), one advisory group (AG) and one task team (TT)¹. Information on these SC-AVI subsidiary bodies is available via the following links: [ET-ETC](#), [ET-WCS](#), [AG-VSA](#) and [TT-LTP](#). In addition, several thematic coordinators and other focal points contribute to the work of the Standing Committee ([more information here](#)).

2.1.4 Final reports, executive summaries and other information pertaining to the outcomes of meetings of SC-AVI and its subsidiary bodies are [available here](#).

2.1.5 Insofar as the WMO Secretariat is concerned, the staffing of the Services for Aviation (AVI) Division comprises Mr Greg Brock, Head, Ms Stéphanie Wigniolle, Scientific Officer, and Ms

¹ Note, ET-WCS arose through a merger in early 2023 of an Expert Team on Aeronautical Meteorological Hazards Science (ET-MHS) and an Expert Team on the Impacts of Climate Change and Variability on Aviation (ET-CCV).

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2.2 WMO contribution to global initiatives (non-exhaustive)

2.2.1 Within the available resources, WMO continues to play an active role in the activities of the ICAO Meteorology Panel (METP) and its working groups (presently WG-MRAD, WG-MIE, WG-MOG and WG-MCRGG²) addressing an array of topics including but not limited to:

- Hazardous weather information service (HWIS) concept;
- De-icing requirements, long-haul operations requirements and terminal area requirements;
- Low-level ice crystal observations as well as high-altitude ice crystal icing;
- ICAO meteorological information exchange model (IWXXM) requirements, IWXXM extensions and IWXXM documentation;
- MET in SWIM (system-wide information management);
- Operation and development of global MET systems, namely:
 - International airways volcano watch (IAVW);
 - World area forecast system (WAFS);
 - Secure aviation data information system (SADIS) and WAFS internet file service (WIFS);
 - Space weather (SWx) information service;
- Cost recovery guidance and governance including issues associated with redefinition of ‘meteorological authority’ and emerging data management/access issues and policies.

2.2.2 In the context of IWXXM, WMO continues to be responsible, at the request of ICAO, for the development and the publication of the IWXXM schemas. The latest version of the IWXXM schema – namely version 2023-1 – was published by WMO in January 2023 and is [available here](#). (Release Notes for version 2023-1 are [available here](#).) This version was a minor release to address the SIGMET and AIRMET packages. Like its predecessor (2021-2), version 2023-1 supports the requirements of Amendments 79 and 80 to ICAO Annex 3. Technical specifications pertaining to IWXXM are included in the [Manual on Codes \(WMO-No. 306\), International Codes, Volume I.3 – Annex II to the WMO Technical Regulations: Part D – Representations derived from data models](#). Insofar as other IWXXM developments are concerned, at time of writing (August 2023), the WMO Task Team on Aviation Data (TT-AvData) is working on a draft schema to support upcoming (November 2024 applicability) Amendment 81 to ICAO Annex 3. This IWXXM schema is expected to be available soon for review. TT-AvData has also recently expanded its expert composition, which should better enable to Task Team to support these IWXXM-related developments.

² Working Group on Meteorological Requirements and Developments (WG-MRAD), Working Group on Meteorological Information Exchange (WG-MIE), Working Group on Meteorological Operations Groups (WG-MOG) and Working Group on Meteorological Cost Recovery Guidance and Governance (WG-MCRGG).

2.2.3 In the context of system-wide information management (SWIM), WMO and ICAO are considering the establishment of a task team (or similar) to address the interoperability needs between the WMO Information System (WIS) and ICAO SWIM. If established, the team/group may comprise experts from WMO INFCOM SC-IMT³ and the above-mentioned ICAO METP WG-MIE.

2.2.4 In the context of the proposed amendment (constituting Amendment 81) to ICAO Annex 3, the new *Procedures for Air Navigation Services – Meteorology* (PANS-MET) (ICAO Doc 10157) and consequential amendments to other ICAO Annexes and PANS with intended applicability in November 2024, WMO submitted an official response to ICAO in June 2023 in reply to State letter AN 10/1-23/1 of 26 January 2023.

2.2.5 In addition to the above-mentioned METP-related activities, WMO actively contributes to ICAO's Committee on Aviation Environmental Protection (CAEP), most notably through CAEP Working Group 2 addressing airports and operations and CAEP ISG addressing impacts and science. CAEP WG2 activities being supported by WMO include the updating of a climate adaptation synthesis report (through literature reviews and the re-running of a global survey on climate impacts) as well as the scoping of a cost impacts study. CAEP ISG activities being supported by WMO include matters relating to contrails and aviation-induced cirrus. WMO also contributes to ICAO's Airport Economics Panel and Air Navigation Services Economics Panel (AEP-ANSEP), particularly through AEP-ANSEP Working Group 4 (WG4) addressing guidance for the cost recovery of aeronautical meteorological services, with relevance of the updating of, inter alia, the *Manual on Air Navigation Services Economics* (ICAO Doc 9161) and *Guide to Aeronautical Meteorological Services Cost Recovery: Principles and Guidance* (WMO-No. 904).

2.2.6 The WMO Secretariat also continues to work with ICAO counterparts towards an update of the working arrangements between ICAO and WMO, thereby helping to enhance the organizations' coordination, collaboration and cooperation, particularly but not only in the aeronautical meteorology domain. After extensive recent work, it is anticipated that the update to the working arrangements will be signed by the WMO Secretary-General and ICAO Secretary General before the end of 2023. In addition, the WMO Secretariat and ICAO Secretariat, in coordination with the chairs of SC-AVI and METP, are seeking to establish, initially in a trial mode, a 'Joint Aviation Forum' (JAF) between WMO and ICAO. The JAF would provide a venue for the parties concerned to periodically discuss, in an informal and online setting, matters of common interest or concern, particular focussing on matter of strategic importance, thereby helping to facilitate inter-agency coordination that will be to the benefit of WMO Members and ICAO States. The JAF would in no way bypass or replace existing WMO and ICAO structures such as SC-AVI and METP. Rather, the JAF would be complementary.

2.2.7 In respect of the International Air Transport Association (IATA), WMO continues to actively contribute to its Accident Classification Task Force (ACTF). WMO is a key contributor to the preparation of the annual IATA Safety Report, 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. The latest (2022) IATA Safety Report, published in March 2023, is [available here in a new interactive format](#). WMO also continues to collaborate with IATA on the further expansion and enhancement of the WMO AMDAR (Aircraft Meteorological Data Relay) observing system, through a WICAP arrangement (WMO-IATA Collaborative AMDAR Programme). Further information on the AMDAR observing system and the WICAP is [available here](#).

2.2.8 Recognizing growing interest on the impacts of climate change and variability on aviation, WMO has also periodically engaged, mostly informally or through existing bodies such as ICAO CAEP, with experts from IATA, Airports Council International (ACI) and the European Union Aviation Safety Agency (EASA) on matters of common interest, such as the downscaling of climate

³ Infrastructure Commission (INFCOM) Standing Committee on Information Management and Technology (SC-IMT).

scenarios to the regional or local level, climate adaptation and resilience and extreme weather event preparedness and mitigation.

2.3 WMO contribution to regional initiatives (non-exhaustive)

2.3.1 Within the available resources, WMO has contributed to activities or developments at a regional level, such as the supply of advice on the establishment of cost recovery arrangements (e.g. in Fiji), the implementation of quality management systems (e.g. in Senegal and Haiti), the establishment of bilateral and/or multilateral SIGMET coordination arrangements and updates to regional SIGMET guides (e.g. in Europe).

2.3.2 In addition, WMO has conducted several training events within the regions, including an Aviation Meteorology Training Seminar in November 2022, which was an online event convened in collaboration with the United Kingdom Met Office, Australian Bureau of Meteorology and New Zealand MetService. The seminar provided training to nearly 60 forecasters and other staff working at aeronautical meteorological services across 42 countries in Africa, Europe, the Middle East and Asia/Pacific, in topics that included forecasting cloud base and visibility for aerodromes, responding to volcanic eruptions and volcanic ash in the atmosphere, and predicting icing. Information on the 2022 seminar, including access to the pre-recorded content, is [available here](#) on the Services for Aviation Moodle training portal (free registration). Regrettably, owing to resource constraints and other considerations, a similar such training seminar will not be conducted by WMO in late 2023. The training seminars may, instead, return later in 2024. In the meantime, WMO Regional Training Centres and/or Regional Associations lead the arranging and conducting of similar capacity development support at the regional or sub-regional level.

2.4 Outcomes of the second session of the Services Commission

2.4.1 The second session of the Services Commission (SERCOM-2) took place from 17 to 21 October 2022 in Geneva, Switzerland. (As alluded above, SERCOM is the parent technical commission of SC-AVI and, as a consequence, SERCOM-2 addressed all of the recommendations arising from an SC-AVI-2 meeting held in March/April 2022.)

2.4.2 The Members of SERCOM formulated recommendations and took decisions on an array of subjects linked to service delivery, including as these relate to the provision of aeronautical meteorological services. Of specific relevance to the aeronautical meteorology community, SERCOM-2 formulated a recommendation on a proposed amendment to the *Technical Regulations* (WMO-No. 49), Volume I, *General Meteorological Standards and Recommended Practices* and update to the *Compendium of WMO Competency Frameworks* (WMO-No. 1209) addressing the qualification and competency requirements of aeronautical meteorological personnel (observers and forecasters). SERCOM-2 also formulated a recommendation pertaining to a plan of action on the discontinuation of *Technical Regulations* (WMO-No. 49), Volume II, *Meteorological Service for International Air Navigation*. These two topics are discussed in more detail below. These two recommendations were consequently submitted to the nineteenth World Meteorological Congress (Cg-19) for consideration and adoption as part of Cg-19 resolutions. (See §2.5 below.)

2.4.3 The next (third) session of the Services Commission, namely SERCOM-3, is tentatively scheduled to take place in Bali, Indonesia from 4 to 9 March 2024, potentially including a one-day Gender Conference.

2.5 Outcomes of the seventy-sixth session of the Executive Council and the nineteenth World Meteorological Congress

2.5.1 The seventy-sixth session of the Executive Council (EC-76) took place from 27 February to 3 March 2023 in Geneva, Switzerland. EC-76 addressed a wide range of issues pertaining

to the coordination of WMO programmes and activities, financial matters (including the proposed budget of the Organization for the nineteenth financial period, 2024-2027), resolutions and recommendations from the regional associations and technical commissions (including those arising from SERCOM-2 in October 2022), and studies and recommendations on matters affecting international meteorology and related activities, such as the [United Nations ‘Early Warnings for All’ initiative](#).

2.5.2 The Executive Council adopted Resolutions 7 and 8 (EC-76) concerning major updates to the *Guide to Practices for Meteorological Offices Serving Aviation* (WMO-No. 732), to be retitled: *Guide to Services for Aviation*) and the *Guide to Aeronautical Meteorological Services Cost Recovery: Principles and Guidance* (WMO-No. 904). The 2023 updates to WMO-Nos. 732 and 904 stemmed from the work of two WMO consultants and SC-AVI over the past 1 to 2 years. At time of writing (August 2023) the updated Guides are undergoing final editing, proofing and translation prior to publication. They are expected to be available on the WMO e-Library soon – [here](#) for WMO-No. 732 and [here](#) for WMO-No. 904 – in several languages.

2.5.3 The nineteenth World Meteorological Congress (Cg-19) took place from 22 May to 2 June 2023 in Geneva, Switzerland. Matters addressed by Cg-19 included: General policy matters; membership of the Organization; General, Technical, Financial and Staff Regulations; activities of constituent bodies (including SERCOM); the approval of strategic plans and budget for the 19th WMO financial period (2024-2027); the election of the WMO President and Vice-Presidents and members of the Executive Council; and the appointment of the Secretary-General. In this latter respect, Prof. Celeste Saulo (Argentina) was appointed to succeed Prof. Petteri Taalas (Finland) as Secretary-General of WMO with effect 1 January 2024. Prof. Saulo is the first female Secretary-General of the Organization in its history.

2.5.4 Having considered the recommendations of SERCOM-2 referenced at §2.4.2 above, Cg-19 adopted Resolution 4.1(2)/1 (Cg-19) [provisional resolution number] concerning an amendment to the WMO technical regulations and an update to supporting guidance addressing aeronautical meteorological personnel qualification and competency requirements and Resolution 4.1(3)/1 (Cg-19) [provisional resolution number] concerning a plan of action for the discontinuation of WMO *Technical Regulations* (WMO-No. 49), Volume II, *Meteorological Service for International Air Navigation*.

2.5.5 The next ordinary session of the World Meteorological Congress will be held in May 2027. An extraordinary session of World Meteorological Congress will be held in May 2025 to address, for example, the Early Warnings for All initiative and other urgent matters.

2.6 *Other relevant developments/initiatives*

Long-term plan for aeronautical meteorology

2.6.1 In 2019 WMO published its inaugural long-term plan for aeronautical meteorology – [available here](#) (English only). 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.

2.6.2 SC-AVI, assisted by its aforementioned task team (TT-LTP), is working towards the development of an update to the long-term plan, however the expected publication timeframe is now 2026 or 2028 rather than 2024 owing to the nature and magnitude of changes that need to be accommodated in the update. The update will seek to elaborate upon some of the many factors influencing the current and future provision of aeronautical meteorological services, including the investment in the global weather enterprise, the recovery from the Coronavirus disease (COVID-19)

pandemic, the aviation industry's demand for seamless, high-quality, georeferenced, digitized meteorological information on a worldwide basis, the advances in science and technology (for example high-resolution, ensemble prediction systems), environmental sustainability, and the future role of aeronautical meteorological personnel.

Gender equality in aeronautical meteorology

2.6.3 In 2021 WMO conducted a global survey on gender equality in the aeronautical meteorology domain. The survey, which yielded more than 500 responses worldwide, was designed to collate information on respondents' experience regarding gender equality in the workplace and the empowerment of women in the aeronautical meteorology domain in general. Staff and management working in this domain, including observers, forecasters, researchers and service managers, from the public and private sector were encouraged to complete the survey.

2.6.4 Following a comprehensive analysis by SC-AVI of the responses, a report on the outcomes of the survey was published by WMO in March 2023 as [AeM SERIES No. 7](#). The final report, in English only, is complemented by a series of multilingual information sheets that highlight some of the key findings: [English](#) | [French](#) | [Spanish](#) | [Russian](#) | [Chinese](#) | [Arabic](#).

2.6.5 The results of the survey are now being used by SC-AVI to devise strategies to increase the involvement of women in the work of WMO, to encourage the promotion of them to higher (leadership) positions of responsibility at the national and international level, and will help integrate a holistic gender equality perspective through WMO's gender action plan and related initiatives.

Aviation Research and Development Project

2.6.6 In 2021 WMO launched Phase 2 of an Aviation Research and Development Project (AvRDP2). AvRDP2 is a collaboration between the WMO Research Board World Weather Research Programme (WWRP) and the SERCOM SC-AVI. Following-on from the success of a Phase 1 AvRDP (2015-2019), the Phase 2 project (2021-2025) aims to develop, demonstrate and quantify the benefits of improvements to the forecasting of significant convection and associated hazards, gate-to-gate. The Project also intends to devote special attention on developing and demonstrating advancements in probabilistic forecasting and statistical methods (for providing confidence information and other assessments for the end-users), as well as on forecast verification and validation. There is a close association between AvRDP2 and the activities being undertaken within the ICAO METP WG-MRAD addressing the hazardous weather information service (HWIS) concept.

2.6.7 An AvRDP2 Scientific Steering Committee (SSC) and Community Advisory Group (CAG) are respectively leading and contributing to AvRDP2. In addition, there is a collaborative partnership between WMO and the Hong Kong University of Science and Technology (HKUST). A science plan for AvRDP2 was consolidated by the SSC in December 2022. More information on AvRDP2 is [available here](#). The AvRDP2 SSC will convene its next meeting at the end of September 2023.

International Workshop on Volcanic Ash

2.6.8 In February 2023 WMO conducted an Eighth International Workshop on Volcanic Ash (IWVA-8) in Rotorua, New Zealand. The workshop, the first of its kind since IWVA-7 in Anchorage in 2015, attracted nearly 60 participants from around the world, across multiple disciplines including volcanology, geophysics and meteorology scientific researchers and operational personnel as well as aviation industry representatives from airline operators, engine manufacturers and regulatory authorities.

2.6.9 With the theme “*From the 2010s to the 2020s and beyond: Managing and mitigating volcanic risks to aviation with an explosion of science*”, the IWVA-8 workshop welcomed a series of oral and poster presentations as well as moderated panel discussions across the following thematic areas: Airframe, engine and avionics susceptibility developments and industry needs; Recent development and upcoming challenges and opportunities for volcano observatories and meteorological services; and the next-generation of volcanic hazard services for aviation. Three recommendations and a statement were formulated by the workshop participants to encourage continued progress in support of the operation and further development of the international airways volcano watch.

2.6.10 A comprehensive report on the proceedings of IWVA-8 was published by WMO in June 2023 as [AeM SERIES No. 8](#) (English only). In addition, copies of all the oral and poster presentations delivered during the workshop are [available on the IWVA-8 homepage here](#).

Aeronautical Meteorology Scientific Webinars

2.6.11 Following the success of a series of Aeronautical Meteorology Scientific Webinars (web-based seminars) in June 2022 and ahead of a potential in-person Aeronautical Meteorology Scientific Conference later in 2024, WMO through SC-AVI and its Expert Team on Weather and Climate Science for Aviation Applications (ET-WCS) is intending to conduct a further series of Aeronautical Meteorology Scientific Webinars on 5, 6 and 7 December 2023 across all six WMO Regional Associations. Whereas the 2022 webinars focussed mainly on convection, the 2023 webinars will likely focus on innovations in the observation and forecasting of turbulence and icing. The webinars will comprise a blend of pre-recorded video presentations and live panel discussions.

2.6.12 At time of writing (August 2023) WMO will soon publish information on the 2023 webinars via the [Services for Aviation homepage](#), including details of the specific topics, the programme of speakers and how to register for free to attend online.

Amendment to Aeronautical Meteorological Personnel Qualification and Competency Requirements

2.6.13 WMO, through SC-AVI and its Expert Team on Education, Training and Competency (ET-ETC), has been reviewing its qualification and competency requirements for aeronautical meteorological personnel (AMP) – namely aeronautical meteorological observers (AMO) and aeronautical meteorological forecasters (AMF) – as contained in the *Technical Regulations* (WMO-No. 49), Volume I, *General Meteorological Standards and Recommended Practices* and supported by guidance in the *Compendium of WMO Competency Frameworks* (WMO-No. 1209).

2.6.14 SC-AVI ET-ETC has determined that the existing aeronautical meteorological personnel (AMP) qualification and competency requirements are not wholly suited to aeronautical meteorological specialisms such as volcanic ash, space weather and tropical cyclones. Indeed, aeronautical meteorological service providers with responsibility to maintain a continuous watch over such phenomena in their area of responsibility presently have little or no means to demonstrate how their specialist AMF fully comply with WMO’s prevailing qualification and competency requirements.

Note: With increasing emphasis on the evolving role of AMP in response to service delivery transformation, consideration has once again turned to the necessity for aeronautical meteorological service providers to adopt a quality management system (QMS), and hence increase compliance with competency standards. Consideration has been given by SC-AVI and ET-ETC to a need to shift the focus away from the prerequisite learning outcomes, as contained in the Basic Instruction Package for Meteorologists (BIP-M) (in force since 2016), towards a skilled and job-ready workforce that is described by the competency frameworks.

2.6.15 Having considered Recommendation 2 (SERCOM-2), in May/June 2023 the nineteenth World Meteorological Congress endorsed Resolution 4.1(2)/1 (Cg-19) [provisional resolution number]

addressing an amendment to the AMP qualification and competency requirements contained in WMO-No. 49, Volume I and supported by guidance in WMO-No. 1209, with an applicability date of 1 January 2026.

2.6.16 In summary, the amendment encompasses the following:

For aeronautical meteorological forecasters (AMF):

- Little to no change.
- Aeronautical meteorological service providers employing AMF possessing the Basic Instruction Package for Meteorologists (BIP-M) can continue to do so.
- Aeronautical meteorological service providers employing AMF can define alternative prerequisite qualifications, as long as they are consistent with the BIP-M.
- Aeronautical meteorological service providers employing AMF may be required to have additional and/or higher levels of qualifications.

For aeronautical meteorological observers (AMO):

- No change.
- Members will continue to decide whether their national circumstances require specific qualifications of AMO.

For other aeronautical meteorological specialists, such as AMP operating in service application areas such as volcanic ash and space weather, the amendment introduces flexible provisions to enable Members to define relevant qualifications for these personnel. Aeronautical meteorological service providers can define alternative or additional prerequisite qualifications (to the Basic Instruction Packages) that provide the underpinning skills and knowledge appropriate for each category of personnel.

2.6.17 A comprehensive communications package on the amendment to the AMP qualification and competency requirements, including downloadable information sheets, a list of frequently asked questions (“FAQs”) and a discussion forum, is [available here](#).

Discontinuation of WMO-No. 49, Volume II, Meteorological Service for International Air Navigation

2.6.18 In response to outcomes of the sixteenth session of the Commission for Aeronautical Meteorology (CAeM-16) in 2018 and the Eighteenth World Meteorological Organization (Cg-18) in 2019, WMO continues to take the necessary steps to discontinue the *Technical Regulations* (WMO-No. 49), Volume II, *Meteorological Service for International Air Navigation* owing, essentially, to its duplication of ICAO Annex 3 (and upcoming *Procedures for Air Navigation Services – Meteorology*, PANS-MET).

2.6.19 A plan of action for the discontinuation of WMO-No. 49, Volume II was finalized by SC-AVI in 2022 and subsequently endorsed by SERCOM through Resolution 6 (SERCOM-2) in October 2022 and by the World Meteorological Congress through Resolution 4.1(3)/1 (Cg-19) [provisional resolution number] in May/June 2023.

2.6.20 The plan of action will see Parts I and II of WMO-No. 49, Volume II, which concern core standards, recommended practices, appendices and attachments, discontinued on 31 December 2023. Meanwhile, Parts III and IV of WMO-No. 49, Volume II, which concern aeronautical climatology and the format and preparation of flight documentation respectively, will be discontinued only once material of continuing relevance has been incorporated into ICAO PANS-MET (provisionally 2026).

2.6.21 A comprehensive communications package on the discontinuation of WMO-No. 49, Volume II, including the detailed plan of action, a downloadable information sheet and list of frequently asked questions (“FAQs”), is [available here](#).

New and recently updated WMO publications

2.6.22 New or recently updated WMO publications of direct or indirect relevance to aeronautical meteorology include:

- [Manual on Codes \(WMO-No. 306\) – International Codes, Volume I.2, Part B – Binary Codes and Part C – Common Features to Binary and Alphanumeric Codes](#) (2022 update)
- [Aerodrome Reports and Forecasts: A User’s Handbook to the Codes \(WMO-No. 782\)](#) (2022 edition)

2.6.23 These and many other WMO publications are available via the [WMO e-Library](#). Pertinent publications in the aeronautical meteorology domain are also [listed here](#).

2.6.24 As alluded at §2.5.2 above, WMO will soon publish major updates to the [Guide to Practices for Meteorological Offices Serving Aviation \(WMO-No. 732\)](#) (to be retitled as the *Guide to Services for Aviation*) and the [Guide to Aeronautical Meteorological Services Cost Recovery: Principles and guidance \(WMO-No. 904\)](#). Both publications were endorsed for publication by the SERCOM-2 session and EC-76 session in October 2022 and February/March 2023 respectively.

Biannual newsletters

2.6.25 WMO issues newsletters on a biannual basis to bring the community up-to-date on the latest global and regional developments in aeronautical meteorology, including national and regional case studies or good practice examples. The most recent WMO Services for Aviation Newsletter (Issue No. 1/2023) was published in June 2023 and is [available here](#). Previous newsletters are [available here](#). Anyone wishing to subscribe (for free) to future newsletters is invited to email a request to the WMO Secretariat: aviation@wmo.int

2.7 Upcoming WMO meetings/events

2.7.1 The following provides an indication of upcoming global WMO meetings/events of relevance, together with weblinks where available. The information provided here is subject to change.

- Third meeting of the Standing Committee on Services for Aviation (SC-AVI-3), 12 to 14 September 2023, Geneva, Switzerland. [More information [available here](#).]
- Second meeting of the AvRDP2 Scientific Steering Committee (SSC-2), 26 to 28 September 2023, Boulder, United States of America.
- 2023 Aeronautical Meteorology Scientific Webinars, 5 to 7 December 2023, online.

Note, the webinars will be held in WMO Regional Associations II (Asia) and V (South-West Pacific) on 5 December 2023, in Regional Associations I (Africa) and VI (Europe) on 6 December 2023, and in Regional Associations III (South America) and IV (North America, Central America and the Caribbean) on 7 December 2023.

- Third session of the Services Commission (SERCOM-3), potentially including a Gender Conference, 4 to 9 March 2024, Bali, Indonesia.
- Third session of the Infrastructure Commission (INFCOM-3), 15 to 19 April 2024, Geneva, Switzerland.
- Seventy-eighth session of the Executive Council (EC-78), 10 to 14 June 2024, Geneva, Switzerland.

2.8 *Available WMO resources and further information*

2.8.1 WMO continues to maintain a Services for Aviation website, [available here](#). This website contains information and resources associated with WMO's Services for Aviation activity area, including direct access to regulatory and guidance materials, meeting documentation and reports, survey findings, newsletters, capacity development training aids and more.

2.8.2 WMO also maintains a Services for Aviation Moodle training portal, [available here](#). Supplementing the above-mentioned website, the Moodle training portal specifically provide aeronautical meteorology training and guidance material sourced from around the world, covering both operational and non-operational aspects of aeronautical meteorology. The portal's primary focus is the specialist needs of the aeronautical meteorological forecaster. To benefit from the full suite of materials hosted on the Moodle training portal, users are encouraged to [register an account, for free, via this link](#).

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.
