



ICAO

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North American, Central American and Caribbean Office

WORKING PAPER

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17/02/24

**Second Meeting of the North American, Central American and Caribbean Working Group
(NACC/WG) Aeronautical Meteorology (MET) Task Force (TF) (MET/TF/02)**

Mexico City, Mexico, 27 February to 1 March 2024

Agenda Item 2: Implementation of the Meteorological Services for International Air Navigation

WMO ACTIVITIES OF RELEVANCE TO ICAO

(Presented by WMO)

EXECUTIVE SUMMARY

This working 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:	Action by the meeting is in Section 3.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency• Economic Development of Air Transport• Environmental Protection
<i>References:</i>	<p>ICAO:</p> <ul style="list-style-type: none">• <i>Annex 3, Meteorological Service for International Air Navigation</i>• <i>Procedures for Air Navigation Services – Meteorology (PANS-MET) (Doc 10157)</i>• <i>Manual on Air Navigation Services Economics (Doc 9161)</i> <p>WMO:</p> <ul style="list-style-type: none">• <i>Technical Regulations (WMO-No. 49), Volume I, General Meteorological Standards and Recommended Practices</i>• <i>Technical Regulations (WMO-No. 49), Volume II, Meteorological Service for International Air Navigation</i>• <i>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.</i>• <i>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</i>

	<ul style="list-style-type: none"> • Guide to Practices for Meteorological Offices Serving Aviation (WMO No. 732) • Aerodrome Reports and Forecasts: A User’s Handbook to the Codes (WMO No. 782) • Guide to Aeronautical Meteorological Services Cost Recovery: Principles and Guidance (WMO-No. 904) • Compendium of WMO Competency Frameworks (WMO-No. 1209) • Long-term Plan for Aeronautical Meteorology (WMO AeM SERIES No. 5) • Outcomes of the 2021 Global Survey on Gender Equality in Aeronautical Meteorology (WMO AeM SERIES No. 7) • Proceedings of the Eighth International Workshop on Volcanic Ash (IWVA-8) (WMO AeM SERIES No. 8) <p>Other:</p> <ul style="list-style-type: none"> • IATA Safety Report 2022
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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.

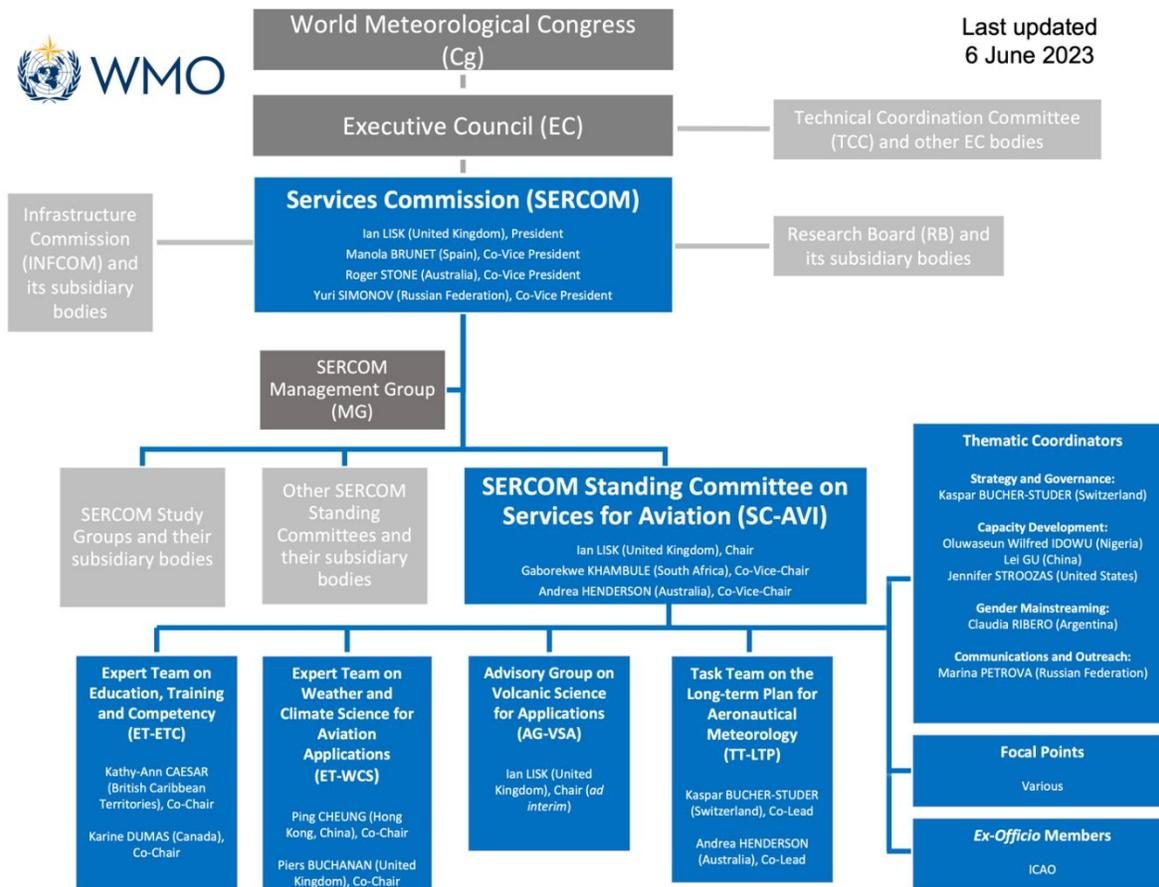
1.2 This information paper provides an overview of some of the recent activities of WMO of relevance to ICAO, particularly in the context of WMO’s latest organization structures, engagement with ICAO and other agencies at the global and regional levels, recent and upcoming events, and other noteworthy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

2. Discussion

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

2.1.1 In 2019 WMO embarked on a major reform of its governance structures. This reform was, to the greatest extent, completed in the 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 (arranged similar to the ICAO 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). 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 Adriana Oskarsson, Associate Programme Officer. The Secretariat of the AVI Division is contactable via email: aviation@wmo.int.

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-MCRGG¹) 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 (January 2024), the WMO Task Team on Aviation Data (TT-AvData) is working on a schema to support the next amendment of 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 the Task Team to support these IWXXM-related developments.

2.2.3 In the context of system-wide information management (SWIM), WMO has sought to establish, in consultation with ICAO, a task team to address the interoperability needs between the WMO Information System (WIS) and ICAO SWIM. The task team, [TT-WIS2-SWIM Interoperability](#), comprises experts from WMO INFCOM SC-IMT2 and the above-mentioned ICAO METP WG-MIE.

¹ 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 Infrastructure Commission (INFCOM) Standing Committee on Information Management and Technology (SC-IMT).

2.2.4 In the context of a proposed amendment 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 constituting Amendment 81 within intended applicability in November 2024, WMO submitted an official response to ICAO in June 2023 (in reply to ICAO State letter AN 10/1-23/1 of 26 January 2023). In recent months WMO was informed by ICAO of a delay to completion of the final review of the proposed amendment by the Air Navigation Commission and, consequently, a delay to adoption by Council. The intended applicability date is now (subject to confirmation) likely to be in November 2025.

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 soon be ratified by the executive of both organizations. In addition, the WMO Secretariat and ICAO Secretariat, in coordination with the chairs of SC-AVI and METP, have established, initially in a trial mode, a 'Joint Aviation Forum' (JAF) between WMO and ICAO. The JAF provides 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 in no way bypasses or replaces existing WMO and ICAO structures such as SC-AVI and METP. Rather, the JAF is 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. The next IATA Safety Report, covering calendar year 2023, is expected to be available soon (March or April 2024). 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 in 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 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, over the course of the past year or so, WMO has conducted several training events within the WMO regions. For example, WMO conducted a Workshop on Aeronautical Meteorology in San Jose, Costa Rica in November/December 2023, in support of Member States and Territories in WMO Regional Association III (South America) and Regional Association IV (North America, Central America and the Caribbean). ICAO contributed to this workshop.

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

2.4.1 The seventy-sixth session of the Executive Council (EC-76) took place in February/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 a SERCOM-2 session 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](#).

2.4.2 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). At time of writing (January 2024), the update to WMO-No. 732 is undergoing final editing, proofing and translation prior to publication,

while the update to WMO-No. 904 was published in December 2023 initially in English but with several other official language versions to follow.

2.4.3 The nineteenth World Meteorological Congress (Cg-19) took place in May/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.

2.4.4 Having considered recommendations arising from SERCOM-2, Cg-19 adopted [Resolution 11 \(Cg-19\)](#) concerning an amendment to the WMO technical regulations and an update to supporting guidance addressing aeronautical meteorological personnel qualification and competency requirements and [Resolution 12 \(Cg-19\)](#) concerning a plan of action for the discontinuation of WMO Technical Regulations (WMO-No. 49), Volume II, *Meteorological Service for International Air Navigation*.

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

2.5 Expectations for the third session of the Services Commission

2.5.1 As alluded at 2.1 above, at the global level of WMO, SERCOM is a technical commission parent body of SC-AVI. SERCOM convenes ordinary sessions approximately once every two years. The third session of the Services Commission ([SERCOM-3](#)) will take place in Bali, Indonesia from 4 to 9 March 2024, including a one-day Gender Action Day on 7 March 2024 (the day immediately prior to International Women's Day).

2.5.2 During the SERCOM-3 Plenary sessions, the Commission is expected to address, inter alia, a report by the president of the Commission, reports by the chairs of SERCOM subsidiary bodies (including SC-AVI), proposals developed by SERCOM subsidiary bodies for the amendment/update of WMO technical regulations and guidance, strategic planning of relevance to the Commission, a report by the SERCOM Gender Focal Point on gender equality within the Commission, the SERCOM work programme and the Commission's subsidiary body structures and leadership for the next intersession period. Also, the Commission will elect a president and up to three vice-presidents to serve the next four-year term.

2.5.3 Insofar as aeronautical meteorology/services for aviation is concerned, and taking into account the recommendations arising from the third meeting of the Standing Committee on Services for Aviation ([SC-AVI-3](#)) held in September 2023, SERCOM-3 will be invited to endorse: the recommendations and statement arising from the Eighth International Workshop on Volcanic Ash ([IWVA-8](#)) held in

February 2023; a proposed 2025 update to Aerodrome Reports and Forecasts: A Users' Handbook to the Codes (WMO-No. 782); and a proposed amendment to the terms of reference of SC-AVI.

2.5.4 During SERCOM-3 a side-event is planning addressing the impacts on Members of service delivery transformation in aeronautical meteorology. Details on the side-event will be available via the [SERCOM-3](#) homepage.

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, with a publication timeframe expected to be between 2026 and 2028. 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 women 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, including a SERCOM gender action plan.

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, as an element of the 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, taking into account a science plan. In addition, there is a collaborative partnership between WMO and the Hong Kong University of Science and Technology (HKUST). More information on AvRDP2 is [available here](#). The AvRDP2 SSC convened its second meeting in Boulder, United States of America in 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, United States of America 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) conducted a second series of Aeronautical Meteorology Scientific Webinars on 5, 6 and 7 December 2023 across all six WMO Regional Associations, including RAs III and IV. Whereas the 2022 webinars focussed mainly on convection, the 2023 webinars focussed on innovations in the observation and forecasting of turbulence and icing of interest to aviation. The webinars comprised a blend of pre recorded video presentations and live panel discussions.

2.6.12 Resources from the 2022 webinars on severe convection and 2023 webinars on icing and turbulence are available [here](#) and [here](#) respectively. An announcement regarding an in-person Aeronautical Meteorology Scientific Conference in October 2024 will be published [here](#) (under 'Related News').

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 11 \(Cg-19\)](#) 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 define 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 12 \(Cg-19\)](#) in May/June 2023.

2.6.20 The plan of action sees 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)
- [Guide to Aeronautical Meteorological Services Cost Recovery: Principles and Guidance \(WMO-No. 904\)](#) (2023 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 mentioned at §2.4.2 above, WMO will soon publish a major update to the Guide to Practices for Meteorological Offices Serving Aviation (WMO-No. 732) (to be retitled as the Guide to Services for Aviation). Once published, the new edition of WMO-No. 732 will be accessible via the WMO e-Library (search field “732”).

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. 2/2023) was published in December 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 session of the Services Commission ([SERCOM-3](#)), including a Gender Action Day, 4 to 9 March 2024, Bali, Indonesia.

- Third session of the Infrastructure Commission ([INFCOM-3](#)), 15 to 19 April 2024, Geneva, Switzerland.
- First meeting of the SC-AVI Expert Team on Weather and Climate Science for Aviation Applications ([ET-WCS-1](#)), 16-18 April 2024, Geneva, Switzerland.
- Seventy-eighth session of the Executive Council ([EC-78](#)), 10 to 14 June 2024, Geneva, Switzerland.
- 2024 Aeronautical Meteorology Scientific Conference (AeroMetSci-2024), 21 to 25 October 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 provides 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 The meeting is invited to note the content in this paper.