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Twenty-Ninth Meeting of the Meteorology Sub-Group (MET SG/29)

Bangkok, Thailand, 18 - 22 August 2025

Agenda Item 2: Review outcomes from previous meetings

OUTCOMES OF THE SIXTH MEETING OF METEOROLOGY PANEL (METP/6)

(Presented by Australia, on behalf of MET Panel Rapporteurs)

SUMMARY

This paper presents a summary of the outcomes of the sixth meeting of the Meteorology Panel (METP/6), concerning the proposed update to the form of the volcanic ash report and the planned retirement of the use of traditional alphanumeric codes and plain text messages for the supply of meteorological information.

1. INTRODUCTION

1.1 The sixth meeting of the Meteorology Panel (METP/6) was held in Montreal from 3 to 7 March 2025. The meeting was attended by 60 experts from 19 States and 6 international organizations (i.e. ASECNA, EUROCONTROL, IATA, IFALPA, IFATCA, and the World Meteorological Organization).

1.2 The METP is progressing a wide range of tasks, defined in its Job Cards assigned by the ICAO Air Navigation Commission, for further improvement of existing meteorological operational practices and the development of advanced meteorological information to support future Global Air Navigation Plan (GANP) Aviation System Block Upgrades (ASBUs).

2. DISCUSSION

Update to volcanic ash report form (AVER form)

2.1 The METP reviewed the proposed update to the reporting form for aircraft volcanic ash encounters, developed by its Working Group on Meteorological Operations Groups (WG-MOG) International Airways Volcano Watch (IAVW) Work Stream.

2.2 With the planned implementation of the advanced volcanic ash information with quantitative values of exceedance of volcanic ash concentration thresholds (i.e. quantitative volcanic ash concentration information (QVA)) and the anticipation of flights into known concentrations of volcanic ash areas, the IAVW Work Stream of the WG-MOG acknowledged the need to improve the efficacy of aircraft reporting of volcanic ash encounters.

2.3 The IAVW Work Stream developed the updated form for volcanic ash encounter reporting, the Aircraft Volcanic Encounter Report (AVER), as a replacement for the legacy Volcanic Activity Report (VAR), which is currently contained in the PANS-ATM, Appendix 1. The AVER form was developed through close coordination with the user community (i.e. IFALPA, IATA Flight Operations Group), with the intention to implement more efficient reporting of volcanic ash encounters for pilots, and to better inform the relevant stakeholders, including volcanic ash advisory centres (VAACs) and State volcano observatories (SVOs) of volcanic ash observations and encounters. It is also expected that the form will likely be built into user tools, rather than be filled out manually and scanned, then sent to the appropriate entities (e.g., VAACs) without any delay.

2.4 The IAVW Work Stream also carefully considered associated changes to ICAO provisions and guidance materials and proposed the translocation of the volcanic ash reporting form from PANS-ATM to PANS-MET (Doc 10157), with the expectation that future refinements may possibly be originated by the Meteorology Panel (METP).

Improvements to the quantitative volcanic ash concentration information (QVA) service

2.5 The WG-MOG IAVW Work Stream provided a proposal to METP/6 to upgrade the QVA service to a Standard in Annex 3, for 'significant' ash clouds, along with an amendment to the spatial and temporal resolution requirements to allow for the incremental improvement of the resolution of the QVA data. Any improvement outside the Annex 3 update cycle would require the agreement of all nine VAACs and the technical details would be included in the *Handbook on the International Airways Volcano Watch* (Doc 9766).

Updates to the Space Weather Information Service (SWIS)

2.6 The WG-MOG Space Weather (SWX) Work Stream provided METP/6 with a proposal for amendment to Annex 3 and PANS-MET (Doc 10157) concerning the SWIS and consisting of higher forecast resolution in the SWX Advisory information. This proposal reflects aviation users' requests for information about the occurrence and possible impacts of SWX phenomena with higher temporal resolution in the first forecast period of SWX advisories, to better support users in their risk assessment and in the adoption of contingency procedures.

2.7 At the same time the SWX Work Stream proposed to METP/6 the introduction of new SWX forecast information (or so-called "outlook") as information about the occurrence and possible impacts of space weather phenomena from 12 to 24 hours, to better support users in their flight planning, risk assessment, and situational awareness.

2.8 The METP/6 supported the proposed inclusion of higher temporal resolution for SWX advisory information; however, it was determined that further consideration of the introduction of new SWX forecast information is necessary to clarify the technical details of the longer-term forecast information (e.g., thresholds for potential impact, period of validity).

2.9 On ground of these relevant proposed changes to the SWIS and in consideration of the delay of the integration of Regional SWX Centres (SWXCs) in the operational SWIS, and the continued lack of a global cost recovery mechanism for the SWIS, the METP/6 agreed with the proposal of the WG-MOG SWX Work Stream to delay the technical review of the SWIS, including the reassessment of the optimal number of SWXCs until sufficient operational experience (e.g., three to five years) is gained after the integration of the Regional SWXC into the SWIS. Moreover, the METP/6 agreed with the recommendation of the WG-MOG SWX Work Stream to request the extension of the deadline for the planned review of the SWIS until the end of 2030, and for developing guidance on the scope and criteria of the review of the SWIS, particularly regarding the reassessment of the optimal number of global and regional SWIS providers.

2.10 Finally the METP/6 agreed with the proposal of the WG-MOG SWX Work Stream contained in the update to Job Card METP.014 for the transition of the SWIS into a SWIM-enabled information service to be completed in time for future Amendment 84 to ICAO Annex 3 (expected applicability date in November 2030), in view of allowing the user community to gain a better understanding of intended information services before updating their operational systems to receive SWX Advisory information and other relevant data to be provided via a SWIM-enabled information service(s).

Updates to World Area Forecast Services (WAFS)

2.11 The WG-MOG WAFS Work Stream informed the METP/6 of several key upgrades introduced that would be applicable in November 2025. These included:

a) 0.25-degree horizontal resolution and improved vertical/temporal resolutions introduced by the two World Area Forecast Centres (WAFCs);
b) multi-step SIGWX forecasts (T+6 to T+48 at 30hourly intervals); and
c) new API's: **SADIS API** (operational from 19 March 2024) and **WIFS API** (from 7 February 2024).

2.12 The WG-MOG WAFS Work Stream also proposed future forecast enhancements, planned for November 2028. These include probabilistic forecasts for turbulence, icing and cumulonimbus clouds. In addition, specific turbulence-type forecasts (i.e. Clear Air Turbulence and Orographic turbulence separately) will be introduced.

2.13 The WG-MOG WAFS Work Stream will propose changes to the PANS-MET (Doc 10157) for the introduction of the WAFS probabilistic and turbulence-type forecasts for coordination by the METP Secretary, no changes to Annex 3 are required. One change relating to WAFS SIGWX informant is required to remove 'widespread sandstorm/dust storm' from WAFS SIGWX charts, as they occur below the lower bounds of the SIGWX charts.

Future transition to MET-SWIM information service and retirement of legacy text format

2.14 The METP/6 discussed the transition of the supply of aeronautical meteorological information to SWIM-enabled information services, in alignment with the recent implementation of SWIM in operational domains. The Working Group on Meteorological Requirements and Development (WG-MRAD) New Requirement Work Stream developed new information services for the provision of aerodrome observation and forecast information, the Aerodrome Meteorological Observation Information Service (AMOIS) and Aerodrome Meteorological Forecast Information Service (AMFIS), respectively.

2.15 Following extensive discussions on the proposal to include the AMOIS and AMFIS in the next amendments to Annex 3 and PANS-MET, the METP/6 agreed to refer the proposal to the WG-MRAD to further refine the requirements for those information services and to complete necessary coordination with other relevant ANC Panels before the next METP meeting (METP/7, currently scheduled in late 2027).

2.16 The METP/6 was informed of the development of the Hazardous Weather Information Services (HWIS), including the details of the emerging HWIS concept, architecture, foreseen roles and responsibilities, and plans for demonstration trials and implementation, as well as a preliminary set of requirements.

2.17 The METP/6 noted that since its last meeting (METP/5, June 2021), significant progress had been made to develop, design and plan practical solutions for the development and deployment of HWIS which would leverage the capabilities afforded by SWIM and the latest industry advancements in forecasting technologies.

2.18 The METP/6 was apprised that the aim of the implementation of HWIS was to expand the global availability and improve the quality of hazardous weather information to support safety and efficiency of aircraft operation by aviation users. HWIS would ensure that operational aviation decision-makers, including flight crews, operators, air traffic controllers and others concerned, could access consistent, up-to-date, more precise information of potentially hazardous weather conditions for en-route phases of flight. In the first instance, HWIS would contain information on Cumulonimbus (CB) clouds, icing and turbulence, with plans to expand its coverage to other identified hazardous weather phenomena in later stages.

2.19 The METP/6 reviewed a *HWIS Communication and Outreach Plan*. It was noted that the aim of the communication and outreach plan was to provide universally consistent, detailed and reliable information on the development of HWIS to ensure the engagement and involvement of all stakeholders to the greatest extent possible, including both potential end users and, specifically, those meteorological service providers that may choose to participate in the HWIS trials or production.

2.20 The METP/6 endorsed the HWIS Communications and Outreach Plan and tasked the WG-MRAD HWIS Work Stream to develop content for each part of the plan for approval by the fifth meeting of the WG-MRAD (MRAD/5) and then commence dissemination of the plan.

2.21 In addition, the METP/6 acknowledged the need for further facilitation of the implementation of the ICAO Meteorological Information Exchange Model (IWXXM). IWXXM became a Standard format in Amendment 79 to Annex 3 in November 2020, while the legacy text-based format (i.e., TAC and abbreviated plain language) also continues to be defined as a Standard.

2.22 Given that IWXXM is defined as one of the standard exchange models for SWIM (*Manual on the System-wide Information Management (SWIM) Concept* (Doc 10039) refers) and the facilitation of IWXXM implementation would be closely in line with above-mentioned transition to SWIM-enabled information services, the METP/6 recommended the amendments to Annex 3 and PANS-MET for the cessation of the use of legacy text-based format in November 2030 (METP/6 Recommendation 5/1 refers). It should be noted that the proposed changes are to be applied to meteorological information for which IWXXM schema are already defined (i.e. METAR, SPECI, TAF, trend forecast, SIGMET/AIRMET, GAMET). In order to allow States and users to prepare, this intended applicability date is proposed to be embedded in Amendment 83 to Annex 3 and Amendment 1 to PANS-MET in November 2027.

2.23 The METP/6 noted that the planning associated with the migration to meteorological information services had greatly progressed since the last version of the *Roadmap for Meteorology in System-Wide Information Management* (MET-SWIM Roadmap). A proposed Version 3 of the MET-SWIM Roadmap was reviewed, which included a re-alignment with the GANP ASBUs, as follows:

- Block 1 (2019-2024): Exchange of TAC and IWXXM forms over the AFS
- Block 2 (2025-2030): Implementation of information services as Recommended Practices
- Block 3 (2031-2036): Cessation of international TAC exchange
- Block 4 (2036-): Information services as the primary exchange mechanism for MET information

2.24 The METP/6 endorsed Version 3 of the MET-SWIM Roadmap and requested the Secretariat to promote its online publication and notify the ICAO Planning and Implementation Regional Groups (PIRGs) of its availability.

2.25 The METP/6 also reviewed the new *Guidelines for MET-SWIM Implementation* (MET-SWIM Guidelines) document created by the WG-MIE. The Panel noted that this new MET-SWIM Guidelines adapted the global SWIM concept to the meteorological service domain and would assist information service providers and users with implementing SWIM-enabled, meteorology-specific information services.

2.26 The METP/6 agreed that the *Plan for Meteorology in SWIM* (MET-SWIM Plan) should be deprecated given its key contents were transferred to the new MET-SWIM Guidelines.

2.27 The METP/6 endorsed the new *Guidelines for MET-SWIM Implementation* document and requested the Secretariat to, accordingly, promote its online publication and notify the PIRGs of its availability.

Increasing the availability of IWXXM

2.28 The METP/6 noted that more than four years after the global implementation of IWXXM, a large percentage of IWXXM data is still missing from the global exchange of meteorological information over the Aeronautical Fixed Service (AFS). It was acknowledged that the implications of delayed global availability of meteorological information in IWXXM would bring about a number of undesirable effects, including a resulting delay in the global transition to SWIM, a financial burden on providers required to issue meteorological information both in TAC and IWXXM forms, a reliance on legacy systems, and un-fulfilled duties of ICAO-designated centres, such as Regional OPMET centres (ROCs), regional OPMET data banks (RODBs), inter regional OPMET gateways (IROGs), WAFCs, VAACs, SWXCs, and Tropical Cyclone Advisory Centres (TCACs)

2.29 A number of proposals were discussed for increasing the global availability of IWXXM, and the METP/6 agreed to the following:

a) the Secretariat coordinate with Regional Offices to facilitate inter-regional exchange of meteorological information in IWXXM form and publish a list of contact points for inter-regional coordination;
b) WG-MIE develop a list of global recipients of the WMO meteorological notifications (METNO) for inclusion in the *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*; and,
c) WG-MIE, in coordination with the Secretariat, consider a means of monitoring States' IWXXM implementation status, and report to METP/7.

New guidance on wind direction referenced to degrees magnetic and true North

2.30 METP/6 noted that Annex 11 mandated reporting surface wind direction in the automatic terminal information service (ATIS) in degrees magnetic, while the surface wind direction in local routine report, local special report, METAR and SPECI were reported in degrees true north, as defined in Annex 3.

2.31 While noting that the ICAO True North initiative encouraged air navigation systems to migrate to operations using degrees true, the METP/6 considered that actual implementation may vary and, as a result, there would still be a continuing need for converting the wind direction to degrees magnetic for the use by ATS (and ATIS). The WG-MRAD developed new guidance on the standard means to covert between magnetic and true directions (and vice versa).

2.32 The METP/6 agreed to the proposed inclusion of new guidance on a standard means to convert wind direction between magnetic and true North into the *Manual of Aeronautical*

Meteorological Practice (Doc 8896), and consequential references to be added to *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444), as well as other guidance materials, including the *Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services* (Doc 9377).

Other key updates

2.33 The METP/6 agreed to the following updates to the *Manual of Aeronautical Meteorological Practice* (Doc 8896):

- Introduction of new higher resolution WAFS gridded data sets;
- introduction of multi-timestep WAFS SIGWX forecasts (and removal of legacy SIGWX forecasts);
- introduction of quantitative volcanic ash concentration information service (QVA);
- guidance on volcano observatory notices for aviation (VONA);
- guidance on methodology to convert wind direction from degrees true to degrees magnetic;
- guidance on map projections;
- removal of the term "OPMET";
- inclusion of basic information and references regarding SWIM information services;
- changes to the term "AFS-Internet Based Services"; and
- removal of Appendix H relating to "METLINK".

2.34 The METP/6 reviewed the outcomes of the 14th Air Navigation Conference (AN-Conf/14). The AN-Conf/14 discussed the update to global operational safety risks, and agreed to include turbulence encounters as one of the additional categories of occurrences, and as part of the global operational safety risks in the 2026-2028 edition of the Global Aviation Safety Plan (GASP).

2.35 The AN-Conf/14 formulated Recommendation 2.3/2, specifically calling for States to share experiences and best practices, and establish mechanisms to improve the availability of routine and special air-reports related to turbulence encounters, and requesting ICAO to identify means for collecting and sharing turbulence data and consider the need for additional provisions for the improvement of turbulence data collection and sharing, as well as to investigate further enhancement of clear-air turbulence forecasting.

2.36 The ANC requested the METP take the lead on Recommendation 2.3/2, in coordination with other Panels, and this work will be progressed in WG-MRAD's HWIS and WG-MOG's WAFS Work Streams.

2.37 The Panel agreed to include new guidelines on access to aeronautical meteorological information to the PANS-MET, identifying that the restricted data policy provided in Recommendation 4/7 of the MET/14 meeting is not aligned with the concept of SWIM and today's data rich environment and with IATA's desire to offset costs to the air operators where possible. The guidelines re-instate the ICAO policy where it is the prerogative of each Contracting State to determine which users in the State concerned, in addition to those identified in Annex 3, will be provided with access to aeronautical meteorological information. The guidelines further recommend that aeronautical meteorological information that does not originate from the Contracting State may only be made available for non-aeronautical purposes under the terms and conditions specified by the State of origin of the information and that a Contracting State may apply appropriate charges to such users.

2.38 The Panel acknowledged the ongoing progress in developing a cost recovery mechanism for the Space Weather Information Service and discussed both lessons learned from the process and implications for the implementation of the HWIS service.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note:

a) the information contained in this paper, and

b) that version 3 of the *Roadmap for Meteorology in System-Wide Information Management* and a new *Guidelines for MET-SWIM Implementation* document will be published soon.

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