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**Fourth Meeting of the North American, Central American and Caribbean Working Group
Implementation of Aeronautical Meteorology (MET) Task Force
(NACC/WG/MT/TF/4)**

Mexico City, Mexico, 28 to 31 July 2026

Agenda Item 3: Follow-up on valid conclusions and decisions from previous NACC/WG and MET/TF meetings

Progress in the Implementation of MET/TF/3 Conclusions and the 2026 Work Programme Tasks in Support of Compliance Review and the Formulation of the 2027 Work Programme
(Presented by the Secretariat)

EXECUTIVE SUMMARY

This Discussion Paper summarizes the main progress, results, deliverables and technical inputs presented during MET/TF/4 in support of the review of the valid MET/TF/3 conclusions and the tasks included in the 2026 Work Programme. The papers and presentations reviewed enabled the Meeting to assess progress related to regional IWXXM implementation, OPMET interoperability, METNO mechanisms, Aircraft-Based Observations (ABO), Quality Management Systems (QMS), VONA implementation and dissemination, designation of Meteorological Authorities and Meteorological Service Providers, contingency planning, operational resilience, aeronautical climatological information, SIGMET coordination, regional cooperation, Multi-Hazard Early Warning Systems (MHEWS), and regional capacity-building activities.

This paper presents only the evidence, progress, needs and proposals identified during the Meeting. Its purpose is to provide information to support future decisions on whether conclusions and tasks should be completed, continued, strengthened or reformulated as part of the 2027 Work Programme.

Strategic Objectives:

- Every Flight is Safe and Secure
- Aviation Delivers Seamless, Accessible, and Reliable Mobility for All
- No Country Left Behind

1. Introduction

1.1 During MET/TF/4, the Meeting reviewed progress achieved in the implementation of the valid MET/TF/3 conclusions and the tasks included in the 2026 Work Programme. Presentations delivered by States, international organizations, task groups and the Secretariat enabled the Meeting to examine results achieved, products developed, activities carried out and ongoing initiatives supporting the implementation of aeronautical meteorological services within the NAM/CAR Regions.

1.2 Discussions addressed topics related to regional IWXXM implementation, OPMET interoperability, METNO mechanisms, VONA implementation and dissemination, Aircraft-Based Observations, the transition to ISO 9001:2026, designation of Meteorological Authorities and Meteorological Service Providers, operational resilience supported by meteorological and climatological information, regional SIGMET coordination, regional cooperation, Multi-Hazard Early Warning Systems, and capacity-building for aeronautical meteorological services.

2. Progress Reported in Support of the 2026 Work Programme Tasks

2.1 T01 – Regional OPMET IWXXM Implementation

2.1.1 Through WP/02, the United States presented a proposal to establish a regional METNO mechanism based on online OPMET tables. The proposal aims to streamline the notification of changes to METAR and TAF bulletins and, subsequently, IWXXM products, while strengthening regional coordination among States, Regional OPMET Data Banks (RODBs), Regional OPMET Centres (ROCs), and Inter-Regional OPMET Gateways (IROGs). The initiative also contemplates the future incorporation of IWXXM tables and the establishment of coordinated mechanisms for the management and notification of changes associated with the international exchange of OPMET information.

2.1.2 Through IP/06 and P/07, Cuba reported on the progress achieved by the Ad Hoc Group composed of Cuba, the United States, Mexico and the Caribbean Meteorological Organization (CMO) in support of regional IWXXM implementation. Activities included TAC-IWXXM translation testing, AMHS interoperability testing between Cuba and the United States, identification of common TAC data quality issues, and activities directed toward the possible establishment of a temporary regional TAC-IWXXM translation service for Caribbean States.

2.1.3 Through IP/03, the United States provided an update on the status of IWXXM implementation and described ongoing activities aimed at enabling the international exchange of IWXXM meteorological products via AMHS, including the future operational dissemination of METAR and TAF in IWXXM format.

2.1.4 Through P/08, the ICAO NACC Office introduced the Air Traffic Services Message Handling System (AMHS), highlighting its role as a secure, high-capacity exchange mechanism for aeronautical messages among States. The presentation explained the differences between Basic AMHS and Extended AMHS, emphasizing that operational exchange of IWXXM products requires AMHS Extended capabilities with File Transfer Body Part (FTBP) support to enable the transport of XML files and other digital meteorological content.

2.1.5 P/08 further described the overall AMHS architecture, the components involved in the generation, validation, transport and reception of IWXXM products, and the functional requirements necessary for States to exchange digital meteorological information. It also highlighted that AMHS currently represents the recommended operational mechanism for the international exchange of IWXXM products while the transition toward SWIM-enabled environments progressively evolves.

2.1.6 Through P/18, the CMO presented progress in the development of a TAC-IWXXM conversion tool developed in cooperation with Brown University. The presentation described currently available capabilities for METAR and SPECI, ongoing validation activities for additional meteorological

products, and work aimed at supporting future integration with EDIS, AMHS, SWIM and other digital information exchange environments.

2.2 T02 – ABO (AMDAR and Other ABO Programmes)

2.2.1 Through WP/05, the Secretariat presented progress achieved in implementing Task T02 related to Aircraft-Based Observations (ABO). The presentation summarized activities carried out with WMO, the ABO Programme, ET-AVI, ET-ABO, and SURV/TF, as well as technical exchanges conducted with COCESNA and SENEAM to explore the potential use of ADS-B, ADS-C, Mode S EHS, MRAR, and other regional capabilities that could support future aircraft-derived meteorological observation initiatives.

2.2.2 P/16 on Aircraft-Based Observations Programme contributions, presented by the WMO ABO Programme, complemented progress related to Task T02 through a review of the status of upper-air observations in the Region, current and emerging aircraft-based meteorological observation sources, including AMDAR, ADS-C, Mode S, UAS, TAMDAR, and AFIRS, as well as the availability of datasets for WMO Regional Association IV (North America, Central America, and the Caribbean). The presentation highlighted that the limited availability of upper-air observations reduces the performance of numerical weather prediction systems and that aircraft-based observations offer a viable alternative for reducing regional observational gaps. It also emphasized the benefit of expanding any regional initiative or strategy emerging from this work to include the SAM Region to promote a coordinated ICAO-WMO approach and enhance observational coverage and aeronautical meteorological data exchange across the NAM/CAR and SAM Regions.

2.2.3 P/16 also addressed recommendations from the ABO community that require special consideration because several of them fall beyond the direct scope of the MET/TF. Identified needs included funding for ACARS/AMDAR systems, coordination among NMHSs, MET providers, ANSPs, and CAAs, enabling SSR Mode EHS, activation of the meteorological component of ADS-C messages, adoption of ADS-B V3 Wx, BVLOS certification for wx-UAS, and allocation of airspace or appropriate procedures for wx-UAS operations. These matters require extensive coordination with other technical groups and competent authorities; however, the MET/TF has assumed a facilitating role in promoting these initiatives.

2.3 T03 – QMS and QSO / Transition to ISO 9001:2026

2.3.1 Through P/19, Costa Rica presented information on Quality Management System preparations for the transition to ISO 9001:2026 in support of Task T03 of the 2026 Work Programme. The presentation emphasized that the revision does not constitute a radical change from ISO 9001:2015 but rather a modernization focused on quality culture, ethical behaviour, separation of risks and opportunities, digitalization, sustainability, climate change, knowledge management, and innovation.

2.3.2 P/19 highlighted the application of these changes to Aeronautical Meteorological Services, recognizing that the quality, timeliness, and reliability of meteorological information have a direct impact on operational safety. The presentation also identified the benefit of strengthening indicators related to the timeliness and quality of METAR, SPECI, TAF, SIGMET, and AIRMET, availability of observation and telecommunication systems, products issued without correction, equipment and data traceability, coordination with ATS, and feedback from pilots, controllers, and operators.

2.3.3 Information presented under this task was also linked to discussions held during the Meeting regarding the need to ensure that meteorological authorities and providers evaluate the accuracy of observations and forecasts in accordance with Annex 3 and the PANS-MET (Doc 10157, Attachments A and B). These elements should be appropriately reflected in QMS, quality control, and quality assurance processes for aeronautical meteorological services.

2.3.4 P/17, presented under ET-AVI, identified regional activities supporting QMS, including the dissemination of technical information through newsletters and a proposed webinar programme on ISO 9001:2026. These contributions may be considered as regional capacity-building support mechanisms related to QMS, without replacing the specific implementation actions that remain the responsibility of States and meteorological service providers.

2.4 T04 – PANS-MET / Annex 3 Amendment 82

2.4.1 Through WP/03, the United States reported on progress related to the implementation and dissemination of Volcano Observatory Notice for Aviation (VONA) advisories. The presentation described the provisions introduced by Annex 3 Amendment 82 regarding the dissemination of VONA in TAC and IWXXM formats, the use of AMHS and EDIS as distribution mechanisms, and practical guidance to support States in implementing these services.

2.4.2 WP/03 complemented activities conducted by the United States during the Day 1 Technical Seminar concerning VONA, QVA, VAAC-MWO coordination, NWSCat, and other implementation activities associated with Amendment 82 and the PANS-MET. Collectively, these inputs provided awareness material, technical guidance, and implementation support for Task T04 of the 2026 Work Programme.

2.5 T05 – DESIGNATION OF METEOROLOGICAL AUTHORITIES AND METEOROLOGICAL SERVICE PROVIDERS

2.5.1 Through WP/06, the Secretariat presented guidance material developed as a deliverable of Task T05 to support the designation and implementation of Meteorological Authorities and Meteorological Service Providers. The documentation included guidance related to Annex 3 SARPs, the PANS-MET, AIP publications, the eANP, EFOD, SAAQ, and the critical elements of the State safety oversight system.

2.5.2 The material presented also highlighted the importance of maintaining consistency among institutional arrangements, aeronautical publications, regional plans, difference reporting mechanisms, and national oversight processes to support the effective implementation and oversight of aeronautical meteorological services.

2.6 T06 – WIFS API Webinar

2.6.1 Topics associated with Task T06, including the WIFS API and the transition toward the new WAFS product access mechanisms, were previously consolidated during the Technical Seminar and are detailed in DP/01. Consequently, they did not require additional discussion during the second- and third-day sessions.

2.7 T07 – Hurricane Contingency Planning / MHEWS and Civil Aviation

2.7.1 Through CMO P/17 on Multi-Hazard Early Warning Systems (MHEWS), hurricane contingency planning, and civil aviation, the relationship between MHEWS, continuity of critical aviation services and preparedness, response, and recovery from severe events in Caribbean States was presented. The presentation highlighted that airports and air navigation systems constitute national critical infrastructure and should be appropriately integrated into national preparedness and response frameworks.

2.7.2 The presentation emphasized that National Meteorological and Hydrological Services use observations, forecasts, and warnings that support both public protection and the continuity of critical aviation services. In this regard, it was highlighted that MHEWS can support the timely activation of Airport Emergency Plans (AEP) and ATS Contingency Plans, helping aviation stakeholders prepare for, respond to, and recover from disruptions associated with severe weather, volcanic ash, and climate change related phenomena.

2.7.3 The CMO also presented activities aimed at strengthening the institutional and technical capabilities of Caribbean NMHSs, including training on impact-based forecasting and warnings, use of the Common Alerting Protocol (CAP), modernization of warning infrastructure, implementation of WIS 2.0, and enhancement of weather radar capabilities, all of which may positively contribute to aviation resilience and the continuity of air navigation services.

2.8 T08 – Integration of Meteorological and Climatological Information for ANSP Resilience

2.8.1 Through P/10, Mexico presented activities related to the use of aeronautical climatological information to support operational resilience, capacity management, strategic planning, air traffic flow management (ATFM), risk assessment, and decision-making by air navigation service providers.

2.8.2 P/10 included examples of aeronautical climatological products and their potential use to identify recurring weather patterns, support operational planning, assess impacts on airport capacity, and contribute to improved predictability and operational resilience.

2.8.3 Through IP/05, the AMCB/TF presented the results of its second meeting and CIIFRA/11, highlighting progress in regional coordination, data exchange, airspace optimization, capacity management, FRA implementation, strengthening of CADENA, and the need for data-driven and performance-based approaches. Although the information paper falls within the scope of the AMCB/TF, its discussions provide valuable input for the development of Task T08. Likewise, its contributions provide key elements of a general nature to support consideration of comprehensive improvements to MET services, particularly regarding the need to provide meteorological products and tools more closely aligned with operational realities and the requirements of air traffic management (ATC, ATFM, and A-CDM).

2.8.4 During the discussion of IP/05, the importance of TAF quality for ATC and ATFM was emphasized, as well as the need to improve the diagnosis and forecasting of difficult-to-predict conditions such as turbulence and wind shear. The need for intuitive graphical products for non-meteorologist personnel was also identified, particularly to support the interpretation of convective activity forecasts

and the visualization of convection detection by ATS personnel. These elements reinforce the need for a closer alignment between MET services and the actual operational needs of aviation.

2.8.5 Through Mexico's P/09, an additional perspective was provided to Task T08 by addressing the impact of severe and extreme weather phenomena on international aviation, their relationship with climate variability and climate change, and the need to transform complex meteorological data into understandable, traceable, and operationally useful alerts. The presentation proposed an operational risk-based approach integrating observation, interpretation, impact assessment, and operational action.

2.8.6 P/09 also presented climatological analysis elements, impact-based cartographic representation, operational exposure by phase of flight, and a Safety Management System (SMS)-oriented early warning architecture. These elements are relevant to support future discussions on operational resilience, integration of meteorological and climatological information, support to ATFM/A-CDM, and improved MET-ATC-Operations communication. Other components of the presentation, although valuable from a methodological perspective, should be considered conceptual or reference material rather than direct deliverables of the 2026 Work Programme.

2.8.7 Through IP/04, the United States presented the experimental Alaskan Aviation Guidance (AAG) product, developed as an automated plain-language forecast for locations in Alaska where observations are available but TAFs are not provided. The information paper constitutes an example of the operational use of technology and numerical guidance to improve situational awareness in remote environments; however, the product falls outside the framework of Annex 3 standardized international civil aviation products and should not be interpreted as a substitute for a TAF nor as a direct task under the 2026 Work Programme.

2.9 T09 – Regional SIGMET Coordination

2.9.1 Through IP/02, the United States presented progress related to the use of NWSChat as a collaborative platform to improve SIGMET coordination, strengthen collaboration among MWOs, VAACs, State volcanological observatories, and other operational users, and support regional coordination during significant meteorological and volcanic events.

2.9.2 Through P/11, Mexico reported progress in the implementation of Task T09, including activities to strengthen SIGMET coordination among adjacent FIRs, the establishment of an Ad Hoc Group composed of Cuba, Mexico, and the United States, and the future use of NWSChat as a tool supporting regional operational harmonization.

2.10 T10 – Regional Cooperation

2.10.1 Through P/12, Mexico reported on activities undertaken to promote regional cooperation in aeronautical meteorology through the Tulum Meteorological Watch Office. Initiatives promoted by SENEAM were reviewed, including regional cooperation agreements, exchange of experts, training workshops, operational attachments, and other technical cooperation mechanisms among States in the NAM/CAR Regions.

2.10.2 During discussions related to regional cooperation and SIGMET coordination, Mexico reported progress toward the implementation of NWSChat as an operational collaboration tool. Honduras

also expressed interest in using this platform and informed the Meeting that it would establish contact with the designated focal points to explore its future participation in regional SIGMET coordination activities.

2.11 T11 – e-ANP (MET Volumes I, II, and III)

2.11.1 No progress was reported under Task T11. However, follow-up related to Canada's request to include the Geological Survey of Canada (GSC) as a State Volcano Observatory (SVO) in the e-ANP was reported. The Meeting was also informed that a Proposal for Amendment (PfA) will be circulated shortly and that any State requiring updates should submit them no later than 20 August 2026.

2.12 T12 – ASBU/BBB Regional Mechanism

2.12.1 Through P/15, Costa Rica presented a review of the interrelationship between the Aviation System Block Upgrades (ASBUs), Basic Building Blocks (BBBs), and Air Navigation Plans (ANPs), highlighting the role of the BBBs as the foundation for the provision of essential air navigation services and as the basis for the progressive implementation of the operational improvements contemplated under the ASBU framework.

2.12.2 The presentation specifically addressed Task T12 of the 2026 Work Programme concerning the application of the regional mechanism for the cyclical verification of the level of implementation of ASBUs and BBBs, including closure of the annual monitoring cycle and preparation of the 2026 MET Report to be presented to NACC/WG/11.

2.12.3 Within the meteorological component, the need for structured verification mechanisms to assess the implementation of the essential services defined in Annex 3 was emphasized, including oversight activities, checklists, quality management systems, and other mechanisms aimed at monitoring the implementation of BBBs in aeronautical meteorology.

2.12.4 The presentation also included examples related to the provision of products supporting low-level operations, such as GAMET and AIRMET, as well as considerations associated with traffic density, terrain complexity, hazardous meteorological phenomena, and users' operational requirements.

3. Key Results Relevant to the Review of MET/TF/3 Conclusions and the 2026 Work Programme

3.1 T01 – Regional OPMET IWXXM Implementation

The transition toward the digital exchange of meteorological information continues to require Extended AMHS capabilities with FTBP support, as well as regional coordination mechanisms for the management of changes to OPMET tables, meteorological bulletins, and future IWXXM exchanges.

3.2 T02 – ABO (AMDAR and Other ABO Programmes)

Aircraft-Based Observations continue to represent an opportunity to reduce regional observational gaps; however, their expansion will require broader coordination among MET providers, ANSPs, air operators, civil aviation authorities, and other specialized technical groups.

3.3 T03 – QMS and QSO / Transition to ISO 9001:2026

The transition to ISO 9001:2026 reinforces the need to strengthen the mechanisms used to evaluate the quality and operational usefulness of aeronautical meteorological services, including the assessment of the accuracy of observations and forecasts in accordance with Annex 3 and the PANS-MET.

3.4 T04 – PANS-MET / Annex 3 Amendment 82

The implementation of VONA and other volcanic ash-related services continues to require effective coordination among volcanological observatories, MWOs, VAACs, aeronautical authorities, and meteorological service providers. Opportunities were identified to leverage existing tools to facilitate compliance with digital information exchange requirements.

3.5 T05 – Designation of Meteorological Authorities and Meteorological Service Providers

Consistency among national institutional arrangements, aeronautical publications, regulatory responsibilities, and State oversight mechanisms remain a fundamental element for ensuring the effective provision of aeronautical meteorological services.

3.6 T06 – WIFS API Webinar

Topics associated with the transition to the new WAFS product access mechanisms were addressed during the Technical Seminar and documented in DP/01.

3.7 T07 – Hurricane Contingency Planning / MHEWS and Civil Aviation

The integration of meteorological information into MHEWS frameworks can strengthen the timely activation of Airport Emergency Plans (AEPs) and ATS Contingency Plans to address severe weather phenomena, volcanic ash, tropical cyclones, and other hazards capable of significantly affecting air operations.

3.8 T08 – Integration of Meteorological and Climatological Information for ANSP Resilience

There is a need to meet the demand for products more closely aligned with operational decision-making, capacity management, operational resilience, and risk management.

3.9 T09 – Regional SIGMET Coordination

Strengthening coordination among MWOs, VAACs, and adjacent FIRs, supported by appropriate collaborative tools, may contribute to greater regional harmonization in the issuance and coordination of SIGMETs related to meteorological phenomena, tropical cyclones, and volcanic ash.

3.10 T10 – Regional Cooperation

Technical cooperation mechanisms, exchange of experts, and capacity-building initiatives continue to be important enablers for the regional implementation of aeronautical meteorological services. The initiatives presented by States provide concrete opportunities to expand regional cooperation and establish new cooperative arrangements and activities in preparation for NACC/WG/11.

3.11 T11 – e-ANP (MET Volumes I, II and III)

The timely updating of meteorological information contained in the e-ANP requires the active participation of States in regional amendment and maintenance processes.

3.12 T12 – ASBU/BBB Regional Mechanism

Regional monitoring mechanisms continue to play an important role in assessing the implementation of the BBBs and the meteorological elements associated with the ASBU framework. National Air Navigation Plans may constitute a useful tool for prioritizing and coherently managing MET needs identified at both the national and regional levels.

4. Suggested Action

4.1 The Meeting is invited to consider the aspects identified in this document to:

- a) support the implementation and strengthening of aeronautical meteorological services in the Region; and
- b) guide future regional activities and initiatives in aeronautical meteorology.

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