International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)

WORKING PAPER

GREPECAS/23 — WP/8.8
29/12/25

**Fifth GREPECAS–RASG-PA Joint Meeting (GREPECAS-RASG-PA/5) and Twenty-Third Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/23)**

Virtual Phase (Asynchronous, 19 January to 17 February 2026)
In-Person Phase (Mexico City, Mexico, 4 to 6 March 2026)

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**Agenda Item 8: Implementation of CAR/SAM Air Navigation**

# METEOROLOGY – IMPLEMENTATION

(Presented by the Secretariat)


**EXECUTIVE SUMMARY**

This paper presents the progress made by the NACC and SAM Regional Offices in the implementation of GREPECAS/22 Conclusions 22/9 and 22/10 and Decision 22/11, as well as in the dissemination of Amendment 82 to Annex 3 and the new PANS MET (Doc 10157), applicable as of November 2025. The paper highlights regional and national training activities on severe meteorological phenomena, the integration of the Multi Hazard Early Warning Systems (MHEWS) approach, the strengthening of meteorological watch within FIRs, and the progress made in preparation for the future introduction of Quantitative Volcanic Ash Information (QVA) from 2026.
Critical challenges identified include the aeronautical meteorology personnel shortage and the need to strengthen coordination to harmonize SIGMET issuance between adjacent FIRs.


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| **Action:** | As indicated in paragraph 4.1. |
| *Strategic Objectives 2026-2050:* | • Every flight is safe and secure<br>• Aviation is environmentally sustainable<br>• Aviation delivers seamless, accessible, and reliable mobility for all<br>• No country left behind<br>• The International Civil Aviation Convention and Other Treaties, Laws and Regulations Address All Challenges<br>• The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All |
| *References:* | • Final Report of GREPECAS/22<br>• Recommendations from the Workshop on Severe Meteorological Phenomena and Aviation, Lima-Peru, June 2026<br>• Recommendations from the Workshop on ICAO Annex 3 Amendment 82 |

## 1. Introduction

1.1 The Twenty Second Meeting of the CAR/SAM Planning and Implementation Regional Group (GREPECAS/22), held in Lima, Peru, in November 2024, reviewed the implementation status of

requirements associated with the provision of aeronautical meteorology (MET) services for international air navigation. As a result, it issued two conclusions and one decision, aimed at strengthening MET service implementation in the Caribbean and South American regions.

1.2 Following these, the North American, Central American and Caribbean Regional Office (NACC), and the South American Regional Office (SAM), with Headquarters support, advanced work that included the dissemination of Amendment 82 to ICAO Annex 3 and the new Procedures for Air Navigation Services—Meteorology (PANS MET, Doc 10157). Both documents became applicable on 27 November 2025, with additional provisions related to Quantitative Volcanic Ash Information (QVA) applicable as of 26 November 2026. Complementary activities were also undertaken to promote MET implementation and regional harmonization, and coordination with the World Meteorological Organization (WMO) was strengthened to ensure quality, standardization, and synergies in aeronautical meteorology.

## 2. Analysis

2.1 During the analysis of MET implementation status, GREPECAS/22 issued the following conclusions and decisions:

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| **Conclusion 22/9** | Dissemination of the impacts of severe meteorological phenomena on flight operations safety |
| **Conclusion 22/10** | Periodic verification of MET, AIM, SAR, ATM, and AGA Basic Building Blocks (BBBs) |
| **Decision 22/11** | Regional agreement for the implementation of a Tropical Cyclone Advisory Centre (TCAC) |

2.2 Additionally, GREPECAS/22 urged the Secretariat to disseminate the requirements included in Amendment 82 to Annex 3 and the new PANS/MET (Doc 10157), considering ICAO had postponed their applicability to November 2025.

2.3 In line with these conclusions and decision, and the follow-up on MET implementation, the Secretariat advanced the following activities:

### Conclusion 22/9: Dissemination of the impacts of severe meteorological phenomena on flight operations safety

2.4 The Secretariat, with support from Projects RLA/06/901, RLA/09/801 (MCAAP), and a SIP, delivered the NAM/CAR/SAM Workshop on Severe Meteorological Phenomena and Aviation from 23 to 27 June 2025, with objectives to:

- assess the impact of climate change and/or climate variability on aviation,
- deepen knowledge and capacity on mechanisms of formation and development of severe meteorological phenomena,
- strengthen monitoring and coding of phenomena affecting aerodrome operations, and
- develop risk mitigation plans for air operations under adverse meteorological conditions.

2.5 Considering the topic’s relevance, national workshops were replicated in Suriname, Guyana, and Colombia within the SAM Region. A workshop was also held in Paraguay to strengthen meteorological watch capabilities for the FIR. Furthermore, to establish coordination procedures for the monitoring of severe weather phenomena, a Regional Workshop on coordination for mesoscale convective complex (MCC) monitoring and volcanic ash surveillance was conducted in Montevideo on 10–11 November for Argentina, Brazil, Paraguay, and Uruguay.

2.6 Additionally, from the NACC Regional Office perspective, work is underway to integrate the Multi-Hazard Early Warning Systems (MHEWS) approach promoted by the WMO, adopted by the MET Task Force as a conceptual framework to strengthen aviation resilience to severe events and climate change/variability, thus aligning CAR/SAM actions with global early warning priorities.

**Conclusion 22/10: Periodic verification of MET BBBs**

2.7 The NACC and SAM Regional Offices have been defining strategies to comply with this GREPECAS/22 conclusion.

2.8 In this context, the Secretariat, coordinated with the NACC Office, requested support from both regional projects to develop a Procedural Guide for monitoring implementation of Basic Building Blocks (BBBs) in aeronautical meteorology (MET) and aeronautical information management (AIM). Project governance bodies approved the allocation of funds for its development. Once completed, a NAM/CAR/SAM regional workshop is expected to be held in 2026 in Mexico City to disseminate procedures and facilitate consistent evaluation of BBB implementation levels.

2.9 Additionally, the NACC Working Group (NACC/WG) agreed to advance toward a cyclic verification mechanism of the Aviation System Block Upgrade (ASBU) and BBBs, as well as to update MET sections of Volumes I/II/III of the electronic Air Navigation Plan (e-ANP), to harmonize monitoring processes and consolidate a common regional reporting framework for GREPECAS.

**Decision 22/11: Regional agreement for the implementation of a TCAC**

2.10 The Secretariat, in coordination with Headquarters, followed up on this Decision by holding virtual meetings with the WMO to assess the technical feasibility of establishing a TCAC for the South Atlantic.

2.11 The Secretariat coordinated with the United States National Hurricane Center to allow technical personnel from Brazil's Integrated Aeronautical Meteorology Centre (CIMAER) to participate in specialized tropical cyclone courses to develop the required competencies.

2.12 With respect to technical feasibility, the WMO has not yet officially provided the expert panel's technical assessment.

**Activities related to the dissemination of Amendment 82 to Annex 3 and the new PANS/MET (Doc 10157)**

2.13 With support from Projects RLA/06/901 and RLA/09/801 (MCAAP), the Secretariat delivered the Workshop on Annex 3 Amendment 82 and the new PANS/MET (Doc 10157) in Lima, Peru, from 26 to 28 August 2025. The NACC/WG adopted an action package to facilitate transition to the new regulatory structure, including: updating responsibilities of the Meteorological Authority and MET Provider, incorporation of IWXXM 3.0 aligned with Amendment 82/PANS-MET, and preparation for the introduction of Quantitative Volcanic Ash Information (QVA) from 2026.

**Other activities in the NACC and SAM Regions**

2.14 Implementation of MET requirements contained in ICAO Annex 3 continues to be monitored. Progress has been observed in MET quality management system implementation, with

certifications achieved by Bolivia, Costa Rica, and Uruguay, as well as progress in the Bahamas (new service provider), Colombia (new service provider), Ecuador, and Mexico (new Meteorological Watch Office).

2.15 GREPECAS should conduct an in-depth analysis of the current aeronautical meteorology personnel (AMP) shortage. This situation has caused service discontinuities in some SAM States, representing increased risk and operational safety concerns due to interruptions in MET services.

2.16 The Meeting should also promote implementation of OPMET exchange using IWXXM as an enabler for the SWIM environment and a required step toward FF-ICE. In the SAM Region, five States have implemented this standard meteorological information exchange model. In the CAR Region, Cuba, the United States, the Dominican Republic, and COCESNA have also advanced in implementation.

2.17 GREPECAS should also analyze procedures to promote agreements enabling harmonized SIGMET issuance (ICAO Annex 3 Recommendation 3.4.4) to improve coherence between adjacent FIRs and enhance regional management of meteorological risks.

2.18 From the NACC perspective, under the NACC/WG framework, actions have been proposed to strengthen and accelerate IWXXM implementation, including:

- adoption of EDIS as an OPMET contingency mechanism;
- establishment of the METNO for TAC/IWXXM OPMET high/change notifications;
- AMHS-FTBP interoperability testing with the Washington and CAR IROGs;
- creation of an ad hoc Cuba-Mexico-United States group to develop a SIGMET coordination methodology between adjacent FIRs

**Coordination with WMO Regional Offices**

2.19 The Secretariat, with cooperation from the NACC and SAM Regional Offices, coordinated the Severe Phenomena and Aviation Workshop with the WMO. Additionally, within the WMO AMDARi Project, Mexico and Peru were nominated as focal points for the Americas, enabling strengthened coordination of aircraft-based observations, improving data coverage and quality in support of operations and numerical weather prediction.

2.20 In addition to the already-established Expert Team on Aviation (ET-AVI) of WMO Regional Association IV, which cooperates with the NACC Office, WMO Regional Association III established a similar aviation team. Together with this team, the SAM Office coordinated the preparation and issuance of a bulletin related to MET service implementation efforts for air navigation in the region, complementing and expanding the six publications issued by ET-AVI of RA-IV, reinforcing good practice dissemination, regional harmonization, and interregional cooperation.

## 3. Conclusions

3.1 The Secretariat has strengthened capacity building for risk assessment of severe meteorological phenomena in States, enabling the development of resilience scenarios and improved response capabilities. This directly contributes to enhanced operational preparedness and risk-based decision-making.

3.2 The Secretariat, jointly with States, is advancing the development of procedures to evaluate BBB implementation status, enabling more systematic and harmonized monitoring of MET requirements.

3.3 The Secretariat, with support from regional projects and regional MET Panel experts, has disseminated the requirements of Amendment 82 to ICAO Annex 3, as well as those in PANS/MET, and established a roadmap for their effective application and monitoring throughout 2026.

3.4 Considering the experience of FIR meteorological watch national capacity-building workshops described in paragraph 2.5, GREPECAS should promote the replication of these workshops to develop homogeneous capacity among CAR/SAM States.

3.5 The Meeting should urge States to implement IWXXM to avoid delays in SWIM adoption. Digital transition is essential for interoperability, improved information exchange, and eventual transition toward FF-ICE and a fully SWIM-enabled environment.

3.6 The status of the Conclusions and Decision remains valid and applicable:

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| **Conclusion 22/9** | Dissemination of the impacts of severe meteorological phenomena on flight operations safety | Valid |
| **Conclusion 22/10** | Periodic verification of MET, AIM, SAR, ATM, and AGA Basic Building Blocks (BBBs) | Valid |
| **Decision 22/11** | Regional agreement for the implementation of a Tropical Cyclone Advisory Centre (TCAC) | Valid |

## 4. Recommended Action

4.1 The Meeting is invited to:

a) Take note of this paper, particularly of regional progress in implementing Annex 3 Amendment 82, PANS-MET, and the joint efforts of NACC and SAM to strengthen MET service provision in both regions.

b) Promote the actions described in paragraph 3.4.

c) Promote the development of regional and national strategies for IWXXM implementation as per paragraph 3.5, including technical support mechanisms and interoperability testing to accelerate adoption among States.

d) Consider developing regional and national strategies for designing and implementing SWIM, ensuring coherence between national plans, CAR/SAM regional frameworks, and global SWIM requirements.

e) Take any other actions the Meeting deems appropriate, including actions related to determining and sustaining Aeronautical Meteorology Personnel needs, to ensure continuity of MET service and improvement of operational quality, particularly in States with deficiencies.

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[i] *The World Meteorological Organization (WMO) AMDAR Project is the Aircraft Meteorological Data Relay (AMDAR): a global aircraft-based meteorological observing system/programme that automatically collects and transmits in-situ data measured by aircraft (mainly air temperature and wind, and in some cases humidity and turbulence), together with position and time information, to support meteorological monitoring and, above all, to improve numerical weather prediction and the meteorological products used by aviation and other sectors.*