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Agenda Item 5.1: Validation of Eastern Caribbean Implementation Priorities

IDENTIFICATION OF AERONAUTICAL METEOROLOGY IMPLEMENTATION PRIORITIES FOR EASTERN CARIBBEAN STATES AND TERRITORIES

(Presented by the Secretariat)

EXECUTIVE SUMMARY

This Information Paper presents a practical framework to assist Eastern Caribbean States and Territories in identifying aeronautical meteorology implementation priorities supporting international air navigation. The framework is based on the ICAO Basic Building Blocks (BBB) concept and the Aviation System Block Upgrade (ASBU) meteorological information thread (AMET). It proposes a progressive implementation approach beginning with the establishment of essential meteorological capabilities, followed by infrastructure and digital modernization initiatives and the progressive integration of meteorological information into air navigation planning and operational decision-making processes. The objective is to facilitate the identification of common regional priorities that may support future implementation activities, modernization initiatives and national air navigation planning efforts.

Strategic Objectives:

- Every Flight is Safe and Secure
- Aviation is Environmentally Sustainable
- Aviation Delivers Seamless, Accessible, and Reliable Mobility for All
- No Country Left Behind
- The International Civil Aviation Convention and Other Treaties, Laws and Regulations Address All Challenges
- The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All

References:

- ICAO Annex 3 — Meteorological Service for International Air Navigation
- ICAO Doc 10157 — Procedures for Air Navigation Services — Meteorology (PANS-MET)
- ICAO Doc 9750 — Global Air Navigation Plan (GANP)
- ICAO Basic Building Block (BBB) Framework
- Aviation System Block Upgrades (ASBU) Framework – AMET Thread
- Aeronautical Meteorology Task Force (MET/TF) Terms of Reference and Work Programme

1. Introduction

1.1 Aeronautical meteorology supports the safety, regularity and efficiency of international air navigation and constitutes an essential component of the air navigation system.

1.2 As Eastern Caribbean States and Territories continue modernizing air navigation services, it is important to identify implementation priorities that address current operational requirements while supporting future air navigation developments.

1.3 This paper proposes a practical implementation framework intended to assist States and Territories in identifying aeronautical meteorology priorities and organizing future modernization efforts.

2. Establishing the Baseline: Essential MET Capabilities

2.1 The ICAO Basic Building Blocks provide a useful reference for identifying the minimum meteorological capabilities required to support international air navigation. These capabilities constitute the foundation upon which future air navigation improvements may be developed.

2.2 These capabilities include:

- a) meteorological observations and reports;
- b) aerodrome forecasts and warnings;
- c) flight briefing support;
- d) SIGMET services and meteorological watch functions, where applicable;
- e) access to global and regional meteorological products and services; and
- f) coordination arrangements supporting air traffic management, aeronautical information management and aerodrome operations.

2.3 Supporting elements necessary for successful implementation include:

- a) qualified personnel meeting applicable ICAO and World Meteorological Organization competency and qualification requirements;
- b) Quality Management System (QMS) implementation;
- c) effective safety oversight capability, including qualified meteorological inspectors;
- d) coordination among Civil Aviation Authorities, Meteorological Authorities, Air Navigation Service Providers and aerodrome operators; and
- e) communications, computer networks and technical infrastructure supporting service continuity and information exchange.

3. Preparing for Future Developments

3.1 The future evolution of aeronautical meteorology extends beyond the provision of traditional meteorological products and increasingly focuses on the integration of meteorological information into operational decision-making processes.

3.2 The Aviation System Block Upgrade framework describes this evolution through progressively enhanced use of meteorological information in support of air navigation operations and system performance.

3.3 Future implementation priorities may therefore include:

- a) digital meteorological information exchange;
- b) implementation of the ICAO Meteorological Information Exchange Model (IWXXM);
- c) modernization of operational meteorological information exchange systems;
- d) enhanced interoperability among aviation information systems;
- e) improved support to operational decision-making processes; and
- f) integration of meteorological information into collaborative and performance-based air navigation environments.

3.4 The objective of these initiatives is not simply the digital exchange of meteorological information but the progressive integration of meteorological information into the planning, management and optimization of air navigation services.

4. Priority Areas for Eastern Caribbean States and Territories

4.1 Based on the current evolution of aeronautical meteorology and common implementation challenges, the following priority areas may warrant consideration by Eastern Caribbean States and Territories.

4.2 Governance, Quality and Safety Oversight, priority should be given to:

- a) implementation and maintenance of Quality Management Systems;
- b) clearly defined responsibilities for Meteorological Authorities and Meteorological Service Providers;
- c) effective meteorological safety oversight capability;
- d) qualified meteorological inspectors and oversight personnel; and
- e) coordination mechanisms supporting air traffic management, aeronautical information management and aerodrome stakeholders.

4.3 Infrastructure and Digital Transformation, priority should also be given to:

- a) communications and computer networks supporting operational meteorological services;
- b) business continuity and operational resilience of technical infrastructure;
- c) modernization of operational meteorological information exchange;
- d) implementation of the ICAO Meteorological Information Exchange Model (IWXXM);
- e) enhancement of Aeronautical Message Handling System capabilities and preparation for future System-Wide Information Management environments; and
- f) interoperability among aviation information systems.

4.4 Integration into Air Navigation Planning, meteorological modernization initiatives should support broader aviation objectives through:

- a) alignment of meteorological modernization initiatives with air navigation modernization activities;
- b) support operational resilience and hazard management initiatives;
- c) contribution to safety enhancement programmes;
- d) inclusion of meteorological priorities within national and regional planning activities; and
- e) recognition of aeronautical meteorology as an enabler of broader air navigation, safety and operational performance objectives.

5. Conclusion

5.1 The identification of implementation priorities provides an opportunity for Eastern Caribbean States and Territories to establish a common vision for the progressive development of aeronautical meteorology capabilities.

5.2 A practical implementation path may be based on three sequential steps:

- 1) establish the essential meteorological capability baseline;
- 2) modernize supporting infrastructure and information exchange arrangements; and
- 3) progressively integrate meteorological information into air navigation planning and operational decision-making activities.

5.3 This approach supports the development of sustainable meteorological capabilities while facilitating future air navigation modernization initiatives and strengthening operational performance, resilience and safety.

5.4 This framework provides a practical Minimum Implementation Path (MIP) for Eastern Caribbean States and Territories:

- 1) establish the baseline;
- 2) modernize the infrastructure;
- 3) integrate meteorological information into air navigation performance planning; and
- 4) leverage regional mechanisms to support implementation and cooperation activities.

The framework is intended to assist States and Territories in progressively developing aeronautical meteorology capabilities while ensuring alignment with broader air navigation modernization, safety and operational performance objectives.