



AP/ATM/10  
WP/12  
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**International Civil Aviation Organization  
UNDP/ICAO Regional Project RLA/98/003  
Transition to CNS/ATM Systems in the CAR and SAM Regions**

**Tenth Meeting/Workshop of ATM Authorities and Planners  
of the CAR/SAM Regions (AP/ATM/10)**

(Lima, Perú, from 10 to 14 May 2005)

**Agenda Item 5: ATFM Implementation in the CAR/SAM Regions**

**Air Traffic Flow Management (ATFM)**

(Presented by the Secretariat)

**Summary**

This working paper contains information on Air Traffic Flow Management (ATFM) in the CAR/SAM Regions.

**References:**

- Report of the ICAO Eleventh Air Navigation Conference, Montreal, September 2003;
- ICAO Annex 11, Air Traffic Services;
- ICAO PANS/ATM Doc. 4444, Air Traffic Management;
- ICAO Doc. 9426, Air Traffic Services Planning Manual;
- CAR/SAM Air Navigation Plan (ANP);
- CAR/SAM Regional Plan for the Implementation of CNS/ATM Systems;
- Air Traffic Flow and Capacity Management Strategy, Eurocontrol;
- Air Traffic Flow and Capacity Management – Evolution Plan for the ECAC States, Eurocontrol.
- Control Flow Management Unit (CFMU) Basic Handbook, Eurocontrol;
- CFMU Handbook Supplements, Eurocontrol.

**1. Introduction**

1.1 The ICAO 11<sup>th</sup> Air Navigation Conference (AN-Conf/11) concluded (**Recommendation 1/1 – Endorsement of the global ATM operational concept**) that ICAO, the States and the regional planning and implementation groups (PIRGs) consider the global ATM operational concept as the common global framework to guide planning for implementation of ATM systems and to focus all ATM development work; use this global ATM operational concept as high-level guidance for development of ICAO CNS/ATM related provisions; and develop transition strategies for implementation of ATM systems based on the global ATM operational concept.

1.2 The AN-Conf/11 also agreed that the operational concept provided a vision that would allow States and Regions to align their planning processes, allow system solution engineering to be directed toward a harmonised and interoperable outcome, allow airspace users and service providers to share data and information to best mutual outcome, and enhance levels of safety, economy and efficiency, for the good of members of the ATM community.

1.3 Likewise, the Conference unanimously agreed that the harmonised implementation of air navigation systems would increase airspace capacity while producing additional benefits, such as more efficient flight profiles and higher safety levels. Therefore, it was agreed that States should implement the regional air navigation plans, recognizing the longer-term vision of the operational concept and the Global Plan, in order to ensure convergence towards a uniform “gate-to-gate” ATM system, and that any implementation plans should fully consider the needs of airspace users.

1.4 Accordingly, in the last few years, the CAR/SAM States, in close coordination with the CAR/SAM Regional Planning and Implementation Group (GREPECAS) and ICAO, have planned and developed an intense programme of activities for the implementation of various ATM functions through the application of CNS/ATM systems, with emphasis on the application of the ATM global operational concept, and using the recommendations formulated by the Eleventh Air Navigation Conference as the frame of reference for future activities.

1.5 In this respect, and in keeping with the analysis of main traffic flows carried out under Project RLA/98/003, Transition to the CNS/ATM Systems in the CAR/SAM Regions, there are airspace sectors that are already having traffic congestion, especially on special and peak periods, basically due to the different capacities of the various ATC systems, or some of them are being affected by traffic congestion, inadequate operation planning at some airports, and airport infrastructure limitations.

1.6 According to the information provided by the Administrations and the analysis carried out under Project RLA/98/003, in view of the foreseen air traffic growth, these measure might not be sufficient to increase airspace capacity and the availability of optimum flight levels to meet the demand in both Regions, despite the improvements made through the implementation of 40 RNAV routes and the restructuring of the ATS route network, the application of longitudinal separation minima of 10 minutes MNT and 80 RNAV, as well as the successful implementation of RVSM and plans to implement RNP in the CAR/SAM Regions.

1.6 The amendment to the CAR/SAM CNS/ATM Regional Plan, approved by GREPECAS/12, will, in turn, permit an amendment to the CAR/SAM Air Navigation Plan (ANP) (Basic Vol. and FASID), which foresees the implementation of national traffic Flow Management Units (FMUs) in most of the traffic flows of both Regions contained in ATM Evolution Tables by 2008, and of the centralised regional ATFM by 2010.

## **Analysis**

### ***National traffic Flow Management Units (FMU) and Centralised Regional ATFM***

2.1 The implementation of national FMUs and of a Centralised Regional ATFM would ensure an optimum air traffic flow in given areas or airspaces in periods when the demand might exceed the available capacity of the ATC system, thus reducing both in-flight and ground delays and avoiding system saturation. This implementation will guarantee a more effective use of the available capacity of airspace and airports, without the need to apply unnecessary restrictions to air operations.

2.2 National FMUs will coordinate and supply all available and required information so that the Centralised Regional ATFM may fulfil its functions and provide the ATFM services in the CAR/SAM Regions to supplement the ATC service provided by the respective ATS authorities/providers in both Regions. **Appendix A** to this working paper shows some of the functions that the Centralised Regional ATFM would have.

### ***Aspects to consider for ATFM implementation***

2.3 According to our experience, the regional implementation of ATFM will be a complicated and painstaking process, and will require the active participation of all stakeholders. In this respect, in order to expedite the ATFM planning and implementation process, the ATFM Task Force (ATFM/TF) of the ATM Committee of the GREPECAS ATM/CNS Subgroup, when developing its Work Programme, should consider, *inter alia*, those aspects shown in **Appendices A** and **B** to this working paper. The Terms of Reference and Work Programme of the ATM/TF are shown in **Appendix C** to this working paper.

2.4 In order to harmonise national plans with the CAR/SAM Regional Plan, it is also necessary for the Administrations to take the necessary measures and develop an ATFM Implementation Programme that defines the actual implementation requirements, analyses the impact, as mentioned in the previous paragraph, and establishes the relevant coordination that will permit an integrated, harmonious and timely regional implementation.

## **3. Suggested action**

3.1 The meeting is invited to take note of the information provided in this working paper, and, if deemed advisable, approve the following draft conclusion:

### **DRAFT**

### **CONCLUSION X/X**

### **NATIONAL ATFM IMPLEMENTATION PLANS**

That, in order to achieve an integrated, harmonious and timely implementation, CAR/SAM Administrations develop a national ATFM implementation programme consistent with the ATFM implementation programme of the Caribbean and South American Regions.

## **Appendix A**

### **Likely functions of a centralized regional ATFM**

- Provide Air Traffic Flow Management (ATFM) services in the Caribbean and South American Regions;
- Collect and compare data on air navigation infrastructure, air traffic control (ATC) capacity in the Caribbean and South American Regions, and on aerodromes used by international air transport, including runway, taxiway, and gateway capacities in both Regions.
- Collect and analyze data on forecast air traffic (controlled flights) in the Caribbean and South American Regions;
- Establish a consistent table of foreseen traffic demand, including *ad hoc* traffic forecasts, a comparison with the available capacity, and the identification of the areas and duration of foreseen critical traffic overloads;
- Coordinate with air traffic service (ATS) authorities/providers and national traffic flow management units (FMU) in order to make all possible efforts to increase the available ATC capacity when necessary.
- When the deficiencies in terms of available ATC capacity cannot be eliminated, determine and apply, in a timely manner, the appropriate tactical measures in coordination with air traffic service (ATS) authorities/providers and national traffic flow management units (FMU), as required, and with the aircraft and aerodrome operators involved.

## **APPENDIX B**

### **Aspects that could be considered for ATFM Implementation**

#### **1. Identification of the operational requirement**

- Traffic congestion during “peak” periods and hours;
- Aircraft not operating at their optimum flight levels;
- Fuel burn.

#### **2. Impact on airspace**

- Optimization of the current structure of the CAR/SAM ATS Routes Network (if necessary);
- Flexible utilization of the airspace (prohibited, restricted and special-use airspaces) and civil/military coordination;
- Mixed operations (aircraft with different performances) in the same airspace;
- Availability of optimum flight levels;
- Need for a better airspace sectorization.

#### **3. Impact on Air Traffic Services**

- ATS standard and contingency Procedures;
- Automation level of the ACC, including the integration level and interoperability;
- Appropriate amended to the CAR/SAM Regional Supplementary Procedures;
- Training of the ATC personnel;
- ATC workload;
- Surveillance and communications coverage in some FIRs.

#### **4. Impact on operations and airport services**

- Delays in apron before to start the towing/taxing for departure;
- Delays for taxi and take off;
- Delays for taxi after landing and for the apron allocation.

#### **5. Cost/Benefit analysis.**

- Air traffic forecast;
- Traffic congestion reduction;
- Reduction in delays;
- Reduction of ATC workload;
- Increment of air operations safety;
- Greater availability of optimum flight levels;

- Fuel and time of flight savings;
- Financial feasibility.

**6. Impact on Civil Aviation Administrations**

- Implementation planning;
- Establishment of a method for air space safety assessment;
- Operational implementation.

## APPENDIX C

### ATFM TASK FORCE

#### **ATM-ATFM/400: Develop an Air Traffic Flow Management (ATFM) system for its future Implementation in the CAR/SAM Regions**

##### **ATFM Task Force**

#### **1. Terms of reference**

Carry out specific studies in order to determine and elaborate guidance material on an Air Traffic Flow Management (ATFM) system to ensure an optimum air traffic flow in the CAR/SAM Regions.

#### **2. Work Programme**

- a) Review the documentation on air traffic flow management and the policies globally established;
- b) Review the ATFM regional plans of other regions;
- c) Review the existing ATFM national plans;
- d) Review the institutional aspects involved in a multinational environment;
- e) Review the ATFM technical and operational aspects;
- f) Identify the minimum requirements to implement ATFM;
- g) Define the principles in which the ATFM CAR/SAM service will be based;
- h) Evaluate different alternatives and strategies that may satisfy the future air traffic flow management in the CAR/SAM Regions;
- i) Prepare a draft of ATFM guidance material for the CAR/SAM Regions; and
- j) Present not later than ATM/6 Committee the guidance material for their approval.

#### **3. Composition**

Argentina, Brazil\*, Chile, Colombia, Costa Rica, Mexico, Peru, United States, Uruguay and COCESNA

\* Rapporteur: Rolim Higinio

#### **4. Task termination date**

ATMC/6 Meeting.