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International Civil Aviation Organization

THIRD MEETING OF THE GREPECAS ATM/CNS SUBGROUP ATM COMMITTEE AIR TRAFFIC MANAGEMENT TASK FORCE – (ATFM/TF/3)

(San Andrés, Colombia, 18 to 22 June 2007)

Agenda Item 2: Necessary documentation on ATFM for the CAR/SAM Regions

(Presented by Brazil)

Summary

The objective of this working paper is to establish a harmonization process for the ATFM implementation in CAR/SAM Regions, taking into consideration the CAR/SAM ATFM Operational Concept, the Draft Plan for the Transition to ATM System in the CAR/SAM Regions and the Regional Project 06/901.

References:

1. Global Air Navigation Plan
2. Report of ATFM/2 Meeting
3. Report of ATM/CNS/5 Meeting
4. Report of GREPECAS/14 Meeting
5. Draft Plan for the Transition to ATM System in the CAR/SAM Regions
6. Regional Project 06/901.

1. Introduction

1.1. In an effort to assist the States in implementing the Global ATM Operational Concept, ICAO developed the new Global Air Navigation Plan. The Global Plan focuses on one perspective, which is the operational and technical improvements that will bring near and medium term benefits to aircraft operators.

1.2. Planning is going to be focused on specific performance objectives, supported by a set of "Global Plan Initiatives" (GPI). States and regions should choose initiatives that meet performance objectives, identified through an analytical process, specific to the particular needs of a State, region, homogeneous ATM area or major traffic flow.

1.3. The ATFM is one of the main Global Plan Initiatives, taking into consideration the need to attend the following performance objectives: Safety, Capacity, Cost-effectiveness and efficiency.

1.4. Regional Planning should take into consideration the intrinsic characteristics of the components of the ATM operational concept, whose facilities may transcend national boundaries, making it necessary a close cooperation between States.

2. Draft Plan for the Transition to ATM System in the CAR/SAM Regions

2.1 The process of development of the Plan for the Transition to ATM System in the CAR/SAM Regions, presented during the GREPECAS/14 meeting, will continue, through the contributory bodies of GREPECAS. The draft plan was developed taking into consideration the new Global Air Navigation Plan. The objective is to apply the Global Plan Initiatives, in order to initiate the transition to the ATM Operational Concept and a complete update of the CAR/SAM Regional Plan for the Implementation of the CNS/ATM System.

2.2 One of the pillars of the plan is the implementation of the ATFM, with the main objective of the establishment of the basis for the application of Demand and Capacity Balancing (DCB), one of the components of the ATM Operational Concept. The extract of the ATFM part of the mentioned plan is attached as an appendix to this working paper. This portion of the document was based on the CAR/SAM ATFM Operational Concept, approved by GREPECAS/14 (conclusion 14/49).

3. Necessary Tasks for the ATFM Implementation in the CAR/SAM Regions

3.1 Taking into consideration the approval of the CAR/SAM ATFM Operational Concept and the development of the Draft Plan for the Transition to ATM System in the CAR/SAM Regions, the planning for ATFM implementation could be considered finalized and the ATFM Task Force should proceed with the tasks involving the implementation itself.

3.2 The role of ATFM Task Force should be, from this meeting on, the harmonization of the ATFM Implementation in the CAR and SAM Regions, as established by GREPECAS/13 Meeting, in accordance with the extract of the report bellow:

"3.6.2.53 The Meeting considered necessary that the procedures during all the implementation process be developed in a harmonious manner among the ATFM units to avoid risking operational safety. This entails establishing a regional and interregional strategy to facilitate and harmonize all the implementation process. The ATFM Task Force will accomplish these planning and harmonization objectives while for the implementation, two scenarios will be established depending on the operational needs and own features of each CAR and SAM Region. The activation of two ATFM Implementation Groups is considered, one for each Region."

3.3. The ATFM Implementation in SAM Region will be supported by the Regional Project 06/901. The main tasks of the mentioned project will be the following:

3.3.1 Obtain and complete the information, learning about the current status in the participating States and organisations with respect to:

3.3.1.1 The methods for estimating airport and ATC capacity;

3.3.1.2 ATFM procedures for the following phases:

a) Airport strategic
b) Airport tactical
c) Airspace strategic
d) Airspace tactical

3.3.1.3 Electronic data bases required for evolutionary phases of the ATFM System

3.3.2 Develop a model action plan for ATFM airport strategic implementation and the corresponding guidelines which should be used by CAR/SAM States and International Organisations for the implementation of FMU and FMP.

3.3.3 Develop a model action plan for airspace ATFM airport tactical implementation and the corresponding guidelines which should be used by CAR/SAM States and International Organisations for the incorporation of new procedures applicable in FMU and FMP.

3.3.4 Develop a model action plan, for ATFM airspace strategic implementation implementation and the corresponding guidelines which should be used by CAR/SAM States and International Organisations for the incorporation of new procedures applicable in FMU and FMP.

3.3.5 Develop a model action plan, for ATFM airspace tactical implementation implementation and the corresponding guidelines which should be used by CAR/SAM States and International Organisations for the incorporation of new procedures applicable in FMU and FMP.

3.3.6 Develop a model action plan for centralised ATFM, in the CAR and SAM Regions.

3.3.7 In coordination with the participating States and organisations, taking into account environmental protection practices and procedures, determine and develop the necessary material for the implementation of ATFM centralized, including the following:

a) Cost-benefit analysis;
b) Definition of data collection plans;
c) Determination of the required automated systems, including performance parameters and the necessary tests and assessments;
d) Updating of the CAR/SAM ATFM operational concept, if necessary;
e) Drafting of a handbook on common operational procedures for air traffic flow management, including, *inter alia*, the following aspects:
   - Procedures applicable to the strategic, pre-tactical, and tactical phases;
   - Procedures for coordination and teleconferencing with FMUs/FMPs, ATS units, ATFMC, users, airports, and other organisations involved;
   - Collaborative decision-making procedures;
   - Methodology to determine airport and ATS capacity;

- Procedure to keep ATFM databases permanently updated;
- Procedures for pilots and ATC;
- Required ATFM messages.

f) Models of the required AICs/NOTAMs and AIP supplements;
g) ATFM document formats to be included in the CAR/SAM web;
h) Amendment to Doc 7030, if necessary;
i) Amendments to the corresponding letters of agreement;
j) ATC simulations;
k) Harmonisation of applicable ANP requirements;
l) ATFM training;
m) Contingency plans.

3.3.8 Assist to the regular programme in the implementation of the action plan for ATFM implementation.

4 Suggested Actions

4.1 The meeting is invited to:

a) Take note of the information provided in this working paper; and

b) Establish the mechanisms to assure the harmonization of the ATFM implementation in the CAR and SAM Regions, taking into consideration the CAR/SAM ATFM Operational Concept, The Draft Plan for the Transition to ATM System in the CAR/SAM Regions and the tasks of the Regional Project 06/901.

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APPENDIX A

EXTRACT OF THE DRAFT PLAN FOR THE TRANSITION TO ATM SYSTEM IN THE CAR/SAM REGIONS

4.4.2.3 **Air traffic flow management**

4.4.2.3.1 The application of timely demand and capacity balancing measures will avoid overburdening the ATM system and provide the necessary conditions for maximising the use of airport and ATC capacity. This will significantly increase airspace capacity and enhance operational efficiency.

4.4.2.3.2 Inasmuch as air traffic congestion and saturation problems in the CAR/SAM Regions are still very specific, the application of air traffic flow management measures should start gradually to allow States, Territories and International Organisations to gain experience, particularly in calculating and maximising ATC and airport capacities.

4.4.2.3.3 The implementation of ATFM in the CAR/SAM Regions should take into account the objective and principles established in Appendix AL to Item 3 of GREPECAS/13, stressing that ATFM measures should foster maximum use of existing capacity without jeopardising safety. Furthermore, it is important to emphasise that AFTM measures should not be used to resolve the occasional deficiencies intrinsic to the ATM system.

4.4.2.3.4 In this way, AFTM will be implemented by stages in the CAR/SAM Regions, in response to established operational requirements. These stages are:

a) Strategic airport implementation
b) Tactical airport implementation
c) Strategic airspace implementation
d) Tactical airspace implementation
e) Centralised implementation

Strategic airport ATFM

4.4.2.3.5 Normally, the adoption of strategic flow management measures in airports located in low traffic density airspace avoids the congestion and saturation of that airspace. Another aspect to be considered is that it is easier to implement strategic ATFM measures in airports because they require less extensive data collection on flight intent (RPL, Official Airline Guide (OAG), flight plans, etc.) and the use of existing computer and infrastructure tools.

4.4.2.3.6 The authorities which establish appropriate regulations to standardise the use of airports slots in the concession of airports to private entities, in order to keep a close coordination for slots management.

4.4.2.3.7 The first step in implementing ATFM in the CAR/SAM Regions should be to establish a common methodology for calculating airport capacity that would make it possible to identify airports where demand exceeds capacity during certain periods. Once these airports have been identified, measures could be taken to optimise use of the existing capacity.

4.4.2.3.8 Strategic ATFM measures in airports should be limited to the use of airport slots for the purpose of ensuring a balance between the demand for scheduled flights and airport capacity. Slot implementation would ensure hourly flight distribution at airports.

4.4.2.3.9 Therefore, procedures should be developed to distribute airport slots among operators with scheduled flights in accordance with predicted airport saturation/congestion. It is also necessary to consider the capacity required to accommodate other airspace users (non-scheduled flights).

Tactical airport ATFM

4.4.2.3.10 ATFM measures in airports should evolve toward the inclusion of non-scheduled flights in demand and capacity balancing procedures. While the implementation of ATFM tactical measures at airports today is not yet complex, it would still require expanding the data collection programme on flight intent to include FPLs and the utilisation of an efficient means of communication between airport operators that conduct non-scheduled flights and FMUs or FMPs, as well as the use of existing computer and infrastructure tools.

4.4.2.3.11 ATFM tactical measures in airports will continue to be limited to the use of airport slots. Even so, airport demand and capacity balancing would also take non-scheduled flights into consideration. At this stage, procedures for airport slot allocation among operators should also consider non-scheduled flights.

4.4.2.3.12 Strategic airport measures are expected to be enough to resolve specific problems at airports with a significant demand for scheduled flights, while tactical measures would be applied only at airports where there are a significant number of non-scheduled flights

Strategic airspace ATFM

4.4.2.3.13 Based on the experience acquired in airport demand and capacity management, the States, Territories and International Organisations should consider making airspace studies, particularly of those where airport ATFM measures alone are unable to resolve problems of congestion and saturation. These strategic ATFM measures should eliminate airspace congestion and saturation. Implementation of these measures would not be very complex, because it would involve only their impact on the establishment of airport slots. It would, however, require the use of more sophisticated computer and infrastructure tools to permit the analysis of air traffic movements in each portion of airspace in order to identify congestion or saturation in control sectors.

4.4.2.3.14 Scheduled flights would be considered in demand and capacity balancing. Airport slot distribution procedures in this stage should take into account airport and airspace saturation/congestion forecasts.

4.4.2.3.15 Strategic airspace ATFM measures are expected to be sufficient to avoid the overloading of control sectors, particularly in airspace with a significant demand for overflights.

Tactical airspace ATFM

4.4.2.3.16 During this ATFM implementation stage, the States, Territories and International Organisations should proceed to the most complex phase, which involves tactical ATFM airspace measures that include dynamic procedures applicable to flights to be carried out within a few hours. The adoption of tactical airspace measures would be highly complex because it would involve applying ATC slots based on the results of continuous demand/capacity analysis. This analysis would call for the use of more sophisticated computer and infrastructure tools than those employed in the previous stage in order to allow for assignment of ATC slots to prevent airspace and airport overloading.

4.4.2.3.17 It is expected that tactical airspace ATFM will be implemented only in States, Territories and International Organisations where there is a clearly-defined operational requirement, bearing in mind that the complexity of such measures would be very costly in terms of automated systems, databases, telecommunication system and training of human resources.

4.4.2.3.18 States, Territories and International Organisations that decide to implement tactical airspace AFTM should develop the applicable ATFM standards, procedures and operating manuals.

Centralised ATFM

4.4.2.3.19 Most States, Territories and International Organisations are expected, when centralised ATFM becomes available, to implement tactical airspace ATFM by making the relevant institutional arrangements and considering the most favourable cost-benefit ratio.

4.4.2.3.20 In order to provide Air Traffic Flow Management (ATFM) service, the centralised ATFM in the CAR and SAM Regions should perform the following activities:

a) Set up and maintain a database in the region where it operates, regarding:

- air navigation infrastructure, air traffic service (ATS) units and registered aerodromes
- relevant ATC and airport capacity; and
- data on foreseen flights

b) Establish a coherent table of predicted traffic demand, its comparison with available capacity and determination of critical traffic overload zones and durations foreseen;

c) Coordinate as needed to increase the available capacity where necessary;

d) When deficiencies in available capacity cannot be eliminated, determine and duly implement ATFM measures where needed, coordinated beforehand with interested aircraft operators and aerodromes;

e) Monitor the outcome of the measures implemented;

f) Coordinate ATFM service with the other centralised ATFM units where needed.

Performance objectives

4.4.2.3.21 ATFM implementation will aim to accomplish the following performance objectives:

a) Safety: ATFM implementation will avoid the overloading of the ATM system, thereby enhancing or maintaining current safety levels.

b) Capacity: By keeping the ATM system free from overload, ATFM will provide the necessary conditions for appropriate aircraft flow, thereby enhancing system capacity.

c) Cost-effectiveness: ATFM will avoid aircraft flight delays and optimise capacity use, thus enhancing the cost-effectiveness of aircraft operators. Maximum capacity use will, furthermore, improve ANSP cost-effectiveness by reducing investment in infrastructure.

d) Efficiency: Maximum use of ATC and airport capacity will allow for improvement of aircraft flight profiles, fostering efficient fuel consumption and a reduction of operating costs in general, resulting in an environmental improvement through the reduction of harmful gas emissions into the atmosphere.