



**Agenda Item 3: Implementation of Air Traffic Flow Management (ATFM) and improvement of procedures for flow coordination between agencies.**

**ATFM TRAINING COURSES**

(Presented by Brazil)

<b>SUMMARY</b>	
This working paper presents to the meeting the current state of the ATFM used in Brazil and the availability of means and structures in the training process applied in the training of its specialists.	
<b>ICAO Strategic Objectives:</b>	<i>A – Operational safety</i> <i>B – Air navigation capacity and efficiency</i>

**1. Introduction**

1.1 With the growth of the aeronautical industry, the number of flights increased significantly and was regulated, due to the limitations of air navigation. As a result, airlines have been challenged by ICAO in the search for solutions to increase airspace capacity.

1.2 In order to meet the aspirations of the aeronautical industry, ICAO has set up a commission to study and propose a solution. The commission, known as the Future Air Navigation System (FANS), opted for satellite-based navigation for better accuracy and thus increase the number of flights by reducing the separation between aircraft. The commission also concluded on the need for a system that manages a large number of flights, in order to avoid impacts on the ATS Services.

1.3 Thus, the creation of the Air Traffic Management System (ATM) was proposed. A system that would not only cover the ATS (ATC Service, Information and Alert) but also the Airspace Management (ASM) and the Air Traffic Flow Management Service (ATFM) that, in an integrated way, would guarantee the safety, fluidity, and efficiency of air operations.

1.4 In Brazil, the ATFM service is centrally provided by the CGNA with the support of the Flow Management Cells established in all ACCs and APPs with significant air traffic demand from the entire SISCEAB area. Center in the city of Rio de Janeiro in 2006.

1.5 CGNA's mission is to manage daily the day-to-day actions of air traffic management and related infrastructure processes in order to contribute to a safe, orderly and efficient flow of air traffic, ensuring that ATC capacity is used to its maximum extent possible and that the volume of traffic is compatible with the capacity declared by the authority to the sufficiency and quality of the services provided within the scope of the Brazilian Airspace Control System (SISCEAB) and related links, in real time and from the intentions of flight.

1.6 Since its inception, the CGNA has designed a plan to manage the flow of daily air traffic within the Brazilian territory and to the events of greater proportions that may overload the ATM system with increased operations. During this period, the Centre participated actively in the United Nations Conference on Sustainable Development (Rio +20) in June 2012, the FIFA Confederations Cup Brazil 2013 and the World Youth Day of Catholic Youth Rio 2013, the 2014 World Cup and the Olympic Games of 2016. These experiences contributed greatly to the growth of ATFM in Brazil.

## 2. Discussion

2.1 For decades, Brazil has been consolidating a leading position in air traffic flow management (ATFM), not limited to investments in equipment and new facilities, but going much further, developing its own processes, emphasizing specialized training and incorporating efficiently, speed and flexibility modern concepts.

2.2 Since 2015, CGNA has been offering ATFM courses to ATCM countries, which address ATC capabilities, track capacity, flow management measures and other features of the ATFM concept. See Appendix to this working paper.

2.3 The purpose of these training courses is to provide students with technical knowledge of concepts related to the ATFM service that are indispensable for the provision of the service focused on collaborative decision making (CDM), a process whose objective is to improve the performance of the ATM system in its entirety through the harmonization of the goals and needs of each member of the ATM community.

2.4 This course aims to train the air navigation service providers of the CAR / SAM region who are interested in implementing or improving the ATFM service in their respective states and seek to harmonize procedures and processes with other countries in the region.

2.5 Between the years of 2015 and 2018, CGNA had the opportunity to raise the knowledge in ATFM in the SAM region, providing training courses for operators in Peru, Argentina, and Paraguay. For the year 2019, the training of new operators in Ecuador and the Republic of Panama is also scheduled for May / June.

## 3. Suggested action

3.1 The Meeting is invited to:

- a) take note of the information provided by this paper work; and
- b) to discuss the improvements resulting from the training and development of Flow Management Units for the SAM Region under aspects of partnerships.

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**APPENDIX****OBJECTIVES AND PRINCIPLES OF ATFM**

## Objectives and principles ATFM

Topic	Objectives and principles ATFM	
Objectives	<ul style="list-style-type: none"> <li>- Understand the ATFM philosophy, its objectives, and principles;</li> <li>- The ATFM service works;</li> <li>- To know terms and definitions;</li> <li>- To know the structure and organization of the ATFM service, as well as the role and responsibility of the members involved</li> </ul>	
Contents		References
<ul style="list-style-type: none"> <li>- Objectives and principles</li> <li>- Benefits of ATFM</li> <li>- Operation of the ATFM service</li> <li>- Systems, processes and operational information that allow the application of ATFM</li> <li>- Principles of the CDM process</li> <li>- Civil/military coordination and flexible use of airspace (FUA)</li> <li>- Organizational structure</li> <li>- Roles and Responsibilities</li> </ul>		Doc 4444 Doc 9971 Local ATFM documents

## Institutional and regulatory precedents of the ATFM

Topic	Institutional and regulatory precedents of the ATFM	
Objectives	To know global and local legislation for an application of the ATFM service	
Contents		References
<ul style="list-style-type: none"> <li>- Practices recommended by ICAO</li> <li>- ICAO Procedures</li> <li>- Local rules and procedures</li> </ul>		ICAO Annex 11 y 15 Doc 4444 AIP and others local documents

## The CDM process in the context of ATFM

Topic	The CDM process in the context of ATFM	
Objectives	<ul style="list-style-type: none"> <li>- To fully know the process of communication and exchange of operational information in real time between the members involved</li> <li>- Understand how the CDM process allows the best decisions to be made</li> </ul>	
Contents		References
<ul style="list-style-type: none"> <li>- Structure and organization of the CDM process</li> <li>- Means of communication</li> <li>- Roles and responsibilities of the participants involved</li> <li>- Interaction between the participants in the different phases of the process</li> <li>- Benefits of the CDM process</li> </ul>		Doc 4444 Doc 9971 Local ATFM documents

## Airport Collaborative Decision Making (A-CDM)

Topic	Airport Collaborative Decision Making (A-CDM)	
Objectives	<ul style="list-style-type: none"> <li>-Understand the process of communication and exchange of operational information in real time between the stakeholders at the airport level.</li> <li>-Understand how the CDM process allows the best decisions to be made by the stakeholders at the airport level.</li> </ul>	
Contents	References	
<ul style="list-style-type: none"> <li>- Structure and organization</li> <li>- Methods and tools</li> <li>- Rules and benefits</li> </ul>	<ul style="list-style-type: none"> <li>Doc 4444</li> <li>Doc 9971</li> <li>Local ATFM documents</li> </ul>	

## ATM Planning

Topic	ATM Planning	
Objectives	<ul style="list-style-type: none"> <li>- Understand the process of optimizing available capacity and how to use other available capacities</li> <li>- Know the factors that impact the capacity</li> </ul>	
Contents	References	
<ul style="list-style-type: none"> <li>- ATC capacity</li> <li>- ATFM planning (how to measure the imbalance between demand and capacity and solutions in the strategic stage)</li> <li>- List of shifts and configurations of sectors</li> <li>- Capacity optimization</li> <li>- Factors that reduce capacity</li> <li>- Track capacity</li> <li>- Factors affecting airport capacity</li> </ul>	<ul style="list-style-type: none"> <li>Doc 4444</li> <li>Doc 9971</li> <li>Local ATFM documents</li> </ul>	

## ATFM Phases

Topic	ATFM Phases	
Objective	Understand the principles of application of the ATFM process in different phases to maintain the balance between demand and capacity	
Contents	References	
<ul style="list-style-type: none"> <li>* Strategic phase</li> <li>* Pre-tactical phase <ul style="list-style-type: none"> <li>- processes of the pre-tactical phase</li> <li>- pre-tactical planning</li> <li>- roles of the actors in the pre-tactical phase</li> <li>- special events planning - slot allocation process</li> </ul> </li> <li>* Tactical phase <ul style="list-style-type: none"> <li>- route changes</li> <li>- tactical management of the PDA</li> </ul> </li> <li>* Post-Operations <ul style="list-style-type: none"> <li>- requirements for analysis</li> <li>- feedback and evaluation</li> <li>- incident report</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Doc 4444</li> <li>Doc 9971</li> <li>Local ATFM documents</li> </ul>	

ATFM measures

Topic	ATFM measures	
Objective	<ul style="list-style-type: none"> <li>- To know the measures available and how to apply them;</li> <li>- Understand the role of the members involved in the process.</li> </ul>	
Contents	References	
<ul style="list-style-type: none"> <li>- Apply, adjust and cancel ATFM measurements</li> <li>- Capacity optimization measures</li> <li>- Demand distribution measures</li> <li>- Adjustment/demand reduction measures</li> <li>- Use of tools to support the processes</li> </ul>	Doc 4444 Doc 9971 Local ATFM documents	

ATFM Data and Tools

Topic	ATFM Data and Tools	
Objective	<ul style="list-style-type: none"> <li>- Ensure full knowledge of ATFM application functions and tools</li> <li>- Understand the need to share information</li> </ul>	
Contents	References	
<ul style="list-style-type: none"> <li>- Tools to support ATFM</li> <li>- Environment data and support tools</li> <li>- Flight data and support tools</li> </ul>	Doc 9971 Local ATFM documents	

ATFM Contingency Procedures

Topic	ATFM Contingency Procedures	
Objective	Fully understand the procedures that should be applied in case of contingency	
Contents	References	
<ul style="list-style-type: none"> <li>* Contingency procedures</li> <li>- unavailability of airspace/airports</li> <li>* Adverse weather conditions</li> <li>- convective climate</li> <li>- short visit</li> </ul>	Local ATFM documents	

Performance-Based Approach (PBA)

Topic	Introduction to the Performance-Based Approach (PBA)	
Objective	Know the legislation, global and local, about PBA	
Contents	References	
<ul style="list-style-type: none"> <li>- The performance-based approach and its advantages</li> <li>- Purpose and application of the performance-based approach</li> <li>- Key Performance Areas (KPA)</li> <li>- Key Performance Indicators (KPI)</li> </ul>	Doc 9854 Doc 9883 Doc 9971	