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(NACC/DCA/11)**

Varadero, Cuba, 28-30 June 2023

**Agenda Item 4: NAM/CAR Regional Safety/Air Navigation Implementation
4.2 Air Navigation Implementation Matters**

ATFM STRATEGY FOR NACC REGION

(Presented by International Air Transport Association (IATA))

EXECUTIVE SUMMARY

This working paper presents an ATFM Implementation Strategy for NACC Region, including proposal for implementation of a ATFM tactical coordination mechanism with a view to evaluate alternatives that can reduce or eliminate impacts caused by contingencies or unexpected events, such as alternative routes, exclusion of specific flights from restrictive measures, relaxation of restrictive measures, etc.

Action:	<ul style="list-style-type: none">- Urge ICAO to lead the implementation of ATFM in the NACC region- Urge NACC states to prioritize their investments in ATFM implementation- Urge the NACC states to adopt the five-year objectives proposed in point 2.3 of this working paper
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Strategic objective 1 – Operational Safety• Strategic objective 2 – Air navigation capacity and efficiency• Strategic objective 5 – Protection of the environment
<i>References:</i>	<ul style="list-style-type: none">- Global Air Navigation Plan- Regional Air Navigation Plan

1. Introduction

1.1 In accordance with the ICAO Doc. 9971 - Manual on Collaborative Air Traffic Flow Management (ATFM), "A methodology to balance demand and capacity should be developed in order to minimize the effects of ATM system constraints. This can be accomplished through the application of an "ATFM planning and management" process. In this initiative, interactive capacity and airspace planning process, airport operators, ANSPs, AUs, military authorities and other stakeholders work together to improve the performance of the ATM system." The process contains three equally important phases: ATM planning, ATFM execution and post-operations analysis.

1.2 It is clear the relationship between an implementation of an ATFM planning and management process and the quality of service provided by a State/ANSP, taking into consideration that this process will allow, among other benefits, the following ones: correct allocation of financial resources, timely implementation of required capacity to meet growing demand, an optimal use of the installed ATC and airport capacity, increase situational awareness of all stakeholders, timely/effective measures to mitigate contingencies, etc.

2. Discussion

2.1 ATM Planning

2.1.1 Also, in accordance with the DOC. 9971, “Three elements of ATM planning must feed the ATFM system: traffic forecast, performance targets, and the general output of ATM planning. The ATM planning phase is therefore a preparatory one. Measures taken in this step include:

- a) reviewing airspace design (route structure and ATS sectors) and airspace utilization policies to look for potential capacity improvements;
- b) reviewing the technical infrastructure to assess the possibility of improving capacity. This is typically accomplished by upgrading various ATM support tools or enabling navigation, communication, or surveillance infrastructure;
- c) reviewing and updating ATM procedures induced by changes to airspace design and technical infrastructure;
- d) reviewing staffing practices to evaluate the potential for matching staffing resources with workload and
- e) the eventual need for adjustments in staffing levels; and
- f) reviewing the training that has been developed and delivered to ATFM stakeholders”

2.1.2 Taking into consideration the requirements established in the DOC. 9971 mentioned above, there are airspaces in the NACC Region with an inappropriate design, mostly related to sectorization and ATC capacity. This issue prevents the use of optimum flight trajectories due to the need to establish flight restrictions, either lateral (use of longer routes) or vertical (use of flight level restrictions), to adjust the demand to the capacity of very large ATC sectors, including those responsible for sequencing aircraft for major airports and for controlling aircraft in the process of climbing and descending.

2.1.3 Regarding CNS infrastructure, it is clear the need of improving ATS surveillance and VHF coverage in some key airspace of the region to allow the reduction of longitudinal separation and increase of the airspace capacity, as well as to prevent technical issues that leads to the need of contingency procedures.

2.1.4 Adjustments in staffing levels is an issue in at least on State of the NACC Region and it must be monitored and implemented as necessary to meet the expected demand in the following years.

2.2 **ATFM execution**

2.2.1 **Strategic Phase**

2.2.1.1 As per DOC. 9971, the strategic phase includes:

- a) a continuous data collection and interpretation process involving a systematic and regular review of procedures and measures;
- b) a process to review available capacity; and
- c) a series of steps to be taken if imbalances are identified. They should aim to maximize and optimize the available capacity to cope with projected demand and, therefore, achieve performance targets.

2.2.1.2 Very most of NACC States did not implement yet the ATFM strategic phase, which prevents Airlines Users and ATC to have a strategic plan to face expected issues in terms of demand and/or capacity. In this sense, in some situations it is common that ATC is obliged to apply improvised/non-standard measures to cope with a demand or a capacity issue that they do not expect, even when the information is available somewhere in the State/ANSP.

2.2.2 **Pre-tactical Phase**

2.2.2.1 Doc. 9971 establishes that the main objective of the pre-tactical phase is to optimize capacity through an effective organization of resources (e.g., sector configuration management, use of alternate flight procedures). The work methodology is based on a CDM process established between the stakeholders (e.g., flow management unit (FMU), airspace managers, AUs).

2.2.2.2 The tasks to be performed during this phase may include the following:

- a) determining the capacity available in the various areas, based on the particular situation that day;
- b) determining or estimating the demand;
- c) studying the airspace or the flows expected to be affected, the aerodrome expected to be saturated, calculating the acceptance rates to be applied according to system capacity;
- d) conducting a comparative demand/capacity analysis;
- e) preparing a summary of ATFM measures to be proposed and submitting them to the ATFM community for collaborative analysis and discussion; and
- f) at an agreed-upon number of hours before operations, conducting a last review consultation involving the affected ATS units and the relevant stakeholders, to fine-tune and determine which ATFM measures should be published through the corresponding ATFM messaging system.

2.2.2.3 It should be recognized that some NACC Regions States are making all possible efforts to elaborate the ATFM Daily Plan (ADP), which should contain the information mentioned in 2.2.2.2. However, this information normally does not reach out most of the stakeholders, including airlines and airports, as well as typically does not include the expected ATFM measures to be applied in some situations.

2.2.3 **Tactical Phase**

2.2.3.1 In accordance with DOC. 9971, during the ATFM tactical phase, solutions and measures are adopted on the day of the operation. Traffic flows and capacities are managed in real time. The ADP is amended taking due account of any event likely to affect it.

2.2.3.2 The tactical phase aims to ensure that:

- a) the measures taken during the strategic and pre-tactical phases actually address the demand/capacity imbalances;
- b) the measures applied are absolutely necessary, and unnecessary measures are avoided/eliminated;
- c) capacity is maximized without jeopardizing safety; and
- d) the measures are applied taking due account of equity and overall system optimization.

2.2.3.3 In NACC Region, one of the main challenges to apply ATFM tactical phase are contingency situations and/or unexpected events that cause significant impact to the ANSPs and/or airspace users. In this sense, it is necessary to adopt a tactical coordination mechanism, with a prompt response, with a view to evaluating alternatives that can reduce or eliminate these impacts, such as alternative routes, exclusion of specific flights from restrictive measures, relaxation of restrictive measures, etc.

2.2.3.4 These tactical coordination mechanisms should be established through the adoption of a process that allows their activation by States, ANSPs and/or airspace users. The process should be based on the possibility of using videoconferences involving the States, ANSPs and airspace users involved, who could make quick and effective decisions, based on the agreements reached in the calls.

2.2.3.5 It is essential to differentiate the activation of the ATS Contingency Plan, which must be done through the mechanisms established in ATS Contingency plans, and the discussion of alternative measures, which could be established within the scope of the ATFM tactical coordination mechanism.

2.2.3.6 For the establishment of the ATFM tactical coordination mechanism, it will be necessary to develop and update a list of ATFM or ATC points of contact (for States that do not have H24 ATFM units), which can be triggered H24 to participate in calls of the Tactical ATFM Coordination Mechanism. These points of contact must have the power to make operational decisions, reached by agreements during the calls, and implement them immediately.

2.2.3.7 The success of the ATFM tactical coordination mechanism requires the participation of all CAR/SAM States, taking into consideration that ATS contingencies and unexpected events typically involve several FIRs and ATC facilities.

2.2.3.8 As an example, a coordination mechanism was activated by CADENA on March 02, 2023, to face an issue related the radar coverage loss in Panama FIR, due to the loss of communication link between Puerto Cabezas radar and ACC Panama. Even though the mechanism has properly worked, with participation of all involved ATC Facilities and a substantial number of Airspace Users, the speed of the decision-making process should be improved to avoid unnecessary losses to the airspace users. In this case, it seems that there were at least two main reasons that slowing down the decision-making process: lack of power of the participants to take decisions about the better procedures to be applied and lack of pre-coordinated procedures for the case of loosing the mentioned radar (ATM planning).

2.2.4 **Post-operations analysis**

2.2.4.1 As established in the Doc. 9971, during this phase, an analytical process is carried out to measure, investigate and report on operational processes and activities. This process is the cornerstone in developing best practices and/or lessons learned that will further improve the operational processes and activities. It should cover all ATFM domains and all the external units relevant to an ATFM service.

2.2.4.2 Post-operations analysis is a key element to provide feedback to the ATM Planning phase, allowing timely planning and implementation of new projects to face bottlenecks and to cope with projected air traffic demand. It is important to note that the information provided by post-operations analysis must be data driven and based on key performance indicators. The figure below from Doc. 9971 summarizes the ATFM planning and management process.

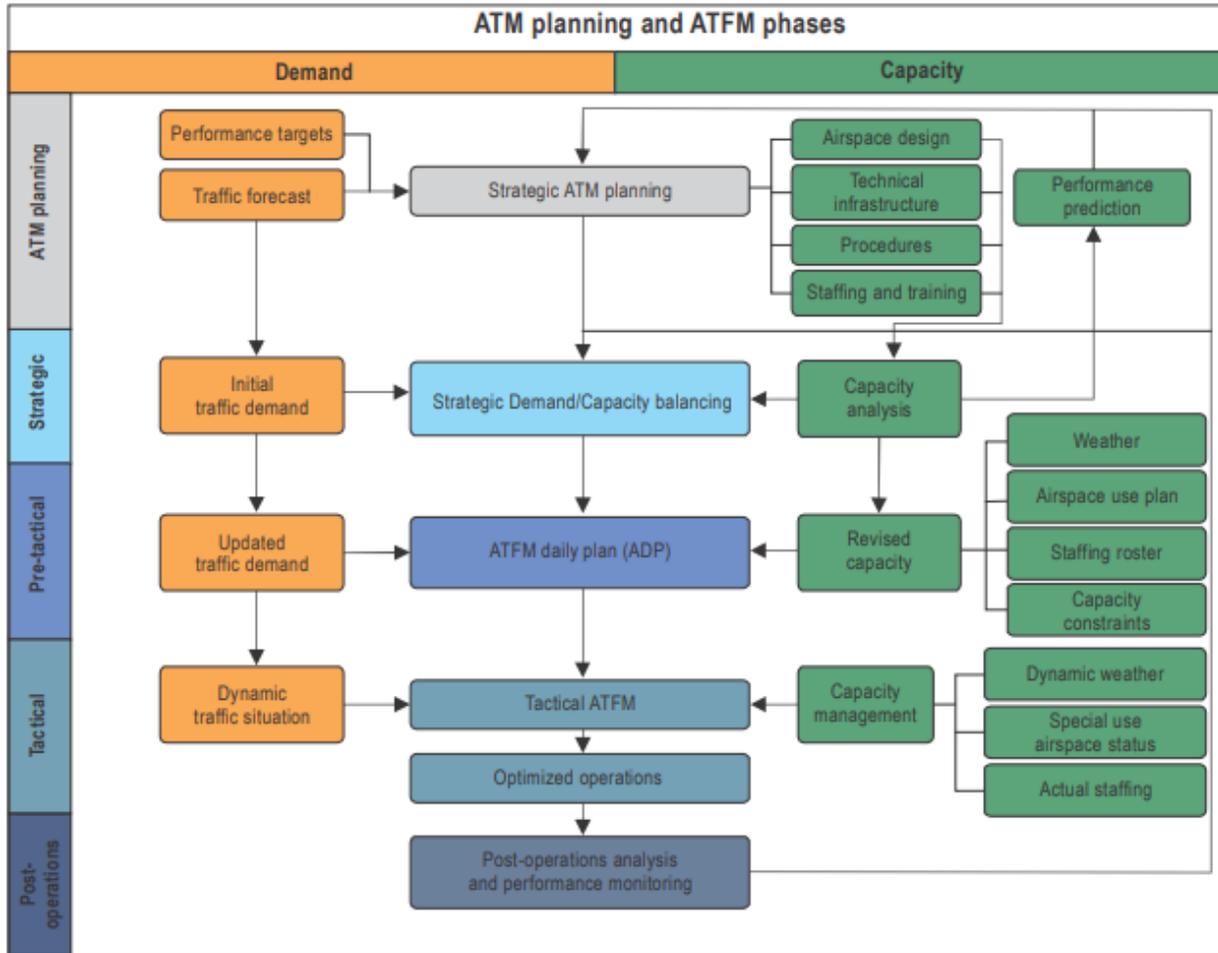


Figure II-4-1. ATM planning and ATFM phases

2.3 Five Years Goals

2.3.1 Short term (2023/2024)

- Prioritize investment on ATFM implementation, including allocation and training of human resources
- Implement an ATFM tactical coordination mechanism in NACC Region
- Implement/Improve and disseminate the ATFM Daily Plan to all stakeholders
- Review ATC sectorization to identify present and future bottlenecks
- Implement Post-operations analysis process based on agreed key performance indicators

2.3.2 Medium term (2025-2027)

- Implement a full ATFM service, including ATM Planning and ATFM Execution (Strategic, Pre-tactical, Tactical, and post-operations phases)

3 Suggested action

3.1 The NACC Meeting is invited to:

- 3.1.1 Take note of the information provided in this working paper.
- 3.1.2 Urge ICAO to lead the implementation of ATFM in NACC Region, in accordance with guidance provided by the Annex 11, Doc 4444 and Doc 9971, as well as to include this initiative in the Regional Air Navigation Plan, as a contribution to comply with the portion related to infrastructure and operational efficiencies to the Long-Term Aspirational Goal (LTAG) to achieve net zero CO2 emissions by 2050.
- 3.1.3 Urge NACC States to prioritize investment in the ATFM Implementation, including allocation and training of human resources, to improve capacity and efficiency, as well as to make optimal use of the installed ATC and Airports infrastructure.
- 3.1.4 Urge NACC States to adopt the five years goals proposed in the item 2.3 of this working paper as part of the SAM Region efforts toward the achievement of net zero CO2 emissions by 2050.

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