



ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

UPDATE OF LETTERS OF AGREEMENT BETWEEN FIRs FOR THE IMPLEMENTATION OF ONE-WAY FLOWS

(Presented by the Dominican Republic)

EXECUTIVE SUMMARY

The sustained growth of global air traffic poses new challenges to airspace management and coordination between flight information regions (FIRs). This note proposes that States consider reviewing and updating letters of operational agreement between adjacent FIRs with the aim of establishing one-way traffic flows for entries and exits, rather than bidirectional routes.

The experience from the Santo Domingo – Miami FIR interface, as part of the 2019 Metroplex project, demonstrated substantial improvements in traffic efficiency and conflict reduction. While this reorganization may result in a slight increase in the distance flown in some cases, this impact is offset by a reduced need for vectors, improved climb to optimal levels, and greater flow predictability.

It is recommended that this approach be promoted within regional cooperation mechanisms as a good practice for improving the safety and efficiency of air traffic in high-density areas.

This initiative is aligned with the objectives of the Global Air Navigation Plan (GANP) and the Aviation System Block Upgrade (ASBU) methodology, particularly in the FRT0 (improved operations through enhanced en-route trajectories) and ACDM (airport collaborative decision making) threads, aimed at improving capacity and reducing operational complexity.

In addition to the operational benefits, this practice contributes to GANP's sustainability goals by reducing en-route delays and additional fuel consumption generated by tactical aircraft, positively impacting the carbon footprint.

<i>Strategic Goals:</i>	This working paper relates to <i>Every Flight is Safe and Secure and Aviation Delivers Seamless, Accessible, and Reliable Mobility for All</i> .
<i>Financial implications:</i>	The activities mentioned in this paper are subject to the availability of resources from the regular budget for 2026-2027-2028, extrabudgetary contributions, and/or voluntary contributions.
<i>References:</i>	Doc 9859, <i>Safety Management Manual (SMM)</i> Doc 9971, <i>Manual on Collaborative Air Traffic Flow Management</i> Doc 9854, <i>Global Air Traffic Management Operational Concept</i> Doc 7030, <i>Regional Supplementary Procedures</i> Doc 4444, <i>Procedures for Air Navigation Services — Air Traffic Management</i>

¹ English and Spanish versions provided by the Dominican Republic.

1. INTRODUCTION

1.1 The constant growth of air operations places increasing demands on air traffic management, particularly at transfer points between flight information regions (FIRs). In many cases, arrival and departure flows share bidirectional routes, which can generate conflicts, unnecessary vectors, and delays in climb to optimal levels, which are reflected in the terminal airspace.

1.2 One strategy that has shown positive results is the implementation of one-way flows, through the differentiated assignment of routes or specific points for entry and exit. This measure improves traffic organization without requiring modifications to the route structure for overflights, which can continue to use two-way routes. The positive experience between the Santo Domingo FIR and the Miami FIR constitutes a replicable model for other regions.

1.3 According to the *Global ATM Operational Concept* (Doc 9854), the separation and ordering of flows at inter-FIR transfer points directly contributes to the reduction of loss of separation incidents and the optimization of the use of airspace, under the principles of foresight, collaboration and transparency.

1.4 According to GANP projections (2023), global air traffic could double by the middle of this century, which will require solutions that optimize capacity without compromising safety, especially in FIRs with dense terminal traffic.

1.5 This type of implementation is consistent with the evolution towards structures based on performance-based navigation (PBN) and communications, navigation, and surveillance (CNS)/ air traffic management (ATM) operations, which seek to improve predictability and reduce the burden of tactical coordination.

2. DISCUSSION

2.1 It is proposed that States, by updating their letters of agreement (LoA) with adjacent FIRs, implement one-way structures exclusively for traffic departing from or arriving at an airport within the corresponding FIR. Overflights would be excluded from this reorganization, while maintaining the use of two-way routes in accordance with efficiency and flexibility criteria.

2.2 ICAO, in the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), establishes that LoA must clearly define the coordination procedures and transfer points for each type of traffic. In high-density regions, the adoption of one-way routes has proven to be a good practice for mitigating lateral and longitudinal conflict risks, as well as for reducing the frequency of tactical interventions.

2.3 The implementation of unidirectional flows allows:

- a) clear segmentation of ATS transfer points according to the direction of traffic (entry or exit);
- b) reduction of radar vectors and tactical changes in altitude or heading;
- c) improved climb to optimal cruising level; and
- d) increased flow predictability and decreased workload for controllers and crew.

2.4 These benefits were observed after the implementation of the model in the coordination between the Santo Domingo FIR and the Miami FIR, as part of the Miami Metroplex project (2019), which allowed improving regional efficiency in an environment of high terminal traffic.

2.5 Implementation requires a joint analysis of sector capacity, projected demand, and interoperability with ATFM systems, as outlined in the *Manual on Collaborative Air Traffic Flow Management* (Doc 9971). In addition, synchronization with collaborative decision making (CDM) will allow airlines and other users to anticipate changes and adapt their flight plans, minimizing operational impacts.

2.6 The Caribbean (CAR)/South American (SAM) Regional Planning and Implementation Group (GREPECAS) has included the optimization of inter-FIR flows in its ATM improvement programs, considering the benefits in terms of safety and efficiency for the North American (NAM)/CAR Region.

2.7 Furthermore, coordination for one-way flows must be supported by automated data exchange (AIDC) and efficient air traffic services (ATS) messages, in accordance with the *Manual of Air Traffic Services Data Link Applications* (Doc 9694) and CNS/ATM standards, ensuring interoperability.

3. CONCLUSION

3.1 The increase in air traffic requires reviewing current flow structures between FIRs and adopting solutions that guarantee the safety and efficiency of the system.

3.2 This approach is in line with the principles of the GANP and the recommendations of the NAM/CAR Regional Group, which prioritize the efficient use of airspace through flow segmentation, favouring the integration of PBN systems and CNS/ATM technologies.

3.3 The transformation of bidirectional routes into unidirectional flows, through the updating of letters of agreement, has proven to be an effective and replicable measure. It is recommended that ICAO promote this practice within the framework of its regional cooperation initiatives, supporting States in its progressive implementation.

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