



WORKING PAPER

FOURTEENTH AIR NAVIGATION CONFERENCE

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**Agenda Item 3: Air Navigation System Performance Improvement
3.2: Phasing out legacy systems**

**FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE
ENVIRONMENT (FF-ICE) DEVELOPMENT IN BRAZIL**

(Presented by Brazil, supported by Latin American Civil Aviation Commission
(LACAC) Members States¹)

EXECUTIVE SUMMARY

This paper presents the past and ongoing actions to enable the implementation in Brazil of the flight and flow — information for a collaborative environment (FF-ICE) concept, which is an important enabler of trajectory-based operation (TBO) implementation. The *Global Air Traffic Management (ATM) Operational Concept* (GATMOC, Doc 9854) sets the vision for the development of the future ATM system. To achieve the vision established in GATMOC, it will be necessary to implement several concepts, including FF-ICE, system-wide information management (SWIM) and TBO.

Action: The Conference is invited to:

- a) share implementation resources; and
- b) analyze and develop initiatives for the best customized cost-benefit in FF-ICE implementation.

1. INTRODUCTION

1.1 The first edition of the *Global Air Traffic Management (ATM) Operational Concept* (GATMOC, Doc 9854) presents the vision of the future ATM system at a high level. The flight and flow information for a collaborative environment (FF-ICE) is a crucial enabler for implementing GATMOC and trajectory-based operation (TBO) and was developed to address the limitations and constraints of the ICAO 2012 flight plan (FPL2012) and the increasing need for the exchange of flight and flow information in a TBO environment.

1.2 The principles of FF-ICE include allowing for an early indication of intent, incorporating information for more automated collaborative decision-making (CDM), avoiding unnecessary limitations

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on information, supporting management by trajectory, ensuring information is machine-readable, assuring that definitions of information elements are globally standardized, among other aspects.

1.3 The transition to FF-ICE is a collaborative effort, considering the replacement of the current flight planning system with one that allows the exchange of globally standardized messages related to flight plans. This transition is expected to occur simultaneously, with the possibility of certain States or Regions acting cooperatively to make the transition together. During this transition phase, both the present flight plans and the FF-ICE will be accommodated for a certain period.

1.4 The FF-ICE implementation brings immediate benefits, addressing the limitations and constraints of the current flight planning mechanism. In the long term, it paves the way for a fully collaborative environment where flight trajectories can be shared and optimized during all phases of flight.

1.5 Brazil has been undertaking several actions and plans to enable the implementation of the FF-ICE concept, as will be described in the next section.

2. DISCUSSION

2.1 In 2019, the Department of Airspace Control (DECEA), the regulatory body for airspace control activities in Brazil, held the first table-top exercise (TTeX), referring to FF-ICE Release 1(R1). Before the implementation of the TTeX, the FF-ICE concept was disseminated, including clarifying what an FF-ICE environment is like, and the various functionalities associated with the concept.

2.2 Furthermore, DECEA presented the FF-ICE components along with considerations in the implementation process, a description of the services, and information exchange models. Additionally, the concepts of TBO, system-wide information management (SWIM), and globally unique flight identifier (GUFI) were disseminated, highlighting the importance of FF-ICE as an enabler for TBO.

2.3 Brazil's table-top exercise results were presented at the Fourth Meeting of the Air Traffic Management Requirements and Performance Panel (ATMRPP) in 2020 through working paper WP/891.

2.4 In this exercise, eight scenarios were designed to focus on the primary FF-ICE/R1 services and raise discussion among participants. Additionally, questions were distributed to the participants to encourage discussions and obtain a perception of the threads, enablers, and elements related to FF-ICE in the Aviation System Block Upgrade (ASBU) and the benefits of using services in Brazil.

2.5 No revisions were requested to the FF-ICE provisions and guidance material, and all participants agreed with the needs and benefits of all the FF-ICE/R1 services. However, the experts considered a time-frame of at least ten years from 2020 as a target, which was considered an appropriate time to update the systems in Brazil and implement any adaptation needed to FF-ICE/R1 in the Brazilian Airspace Control System.

2.6 In 2023, DECEA presented a working paper at the Twenty-Ninth Workshop/Meeting of the SAM Implementation Group (SAM/IG/29-WP/5.1) to disseminate the concepts of FF-ICE, TBO and others throughout the South American (SAM) Region, and reported on the proposals developed by the Air Navigation Commission (ANC) to amend the Annexes, Procedures for Air Navigation Services (PANS) and guidance material, with an applicability date in the coming years, and technical and operational validations of these proposals and the concept itself underway in other Regions. In the same year, Brazil also provided an online briefing concerning the TTeX conduction for South American States.

2.7 DECEA is developing the *Guidelines and the Implementation Plan* for Brazil's FF-ICE concept. This document intends to include the expected implementation of the mandatory services provided for in FF-ICE/Release 1 and, initially, a few of the mandatory services revised for FF-ICE/Release 2.

2.8 In addition, DECEA started an analysis of the systems currently used for processing flight plans and performing air traffic management to identify requirements for implementing the FF-ICE concept, which will be defined in the implementation plan under development.

2.9 Finally, DECEA intends to conduct a TTE_x of FF-ICE Release 2 soon and present the results to ATMRPP.

3. CONCLUSION

3.1 Brazil supports the AN-Conf/14-WP/11 - Cessation of ICAO 2012 flight plan by 2034, presented by the ICAO Secretariat.

3.2 In order to reap the full benefits of FF-ICE services and to step closer towards the GATMOC vision, Brazil is planning to implement some of the services from FF-ICE Releases 1 and 2 as soon as possible in accordance with the ICAO provisions for the cessation of the FPL2012.

3.3 The Conference is invited to agree on the following recommendation:

That States:

- a) share implementation resources; and
- b) analyse and develop initiatives for the best customized cost-benefit in flight and flow information for a collaborative environment (FF-ICE) implementation.

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