



Agenda Item 3: Report on activities and deliverables of the GESEA and Subgroups.

AIRSPACE OPTIMIZATION IN BRAZIL

(Presented by Brazil)

SUMMARY

This paper aims to present the update of the implementation of Airspace Concepts projects, the design of IFR Procedures and other actions adopted by DECEA for the optimization of Brazilian airspace.

REFERENCES

- SAM/IG Meetings
- Doc 9613 – Performance Based Navigation (PBN) Manual
- Doc 8168 – ICAO PANS-OPS/611, Volume I and II

1. INTRODUCTION

1.1 The conclusions obtained during GREPECAS/18 indicate the need for States to increase efforts for the publication and implementation of IFR routes and procedures for Terminal Control Area (TMA) based on the PBN concept to increase or maintain operational safety and security air navigation efficiency in the SAM Region.

1.2 This commitment assumed by States is a topic frequently addressed during SAM/IG meetings, where it is highlighted that such initiatives must be implemented in close coordination between States, ANSPs, airlines and other airspace users.

1.3 In this sense, this working paper presents an update on the implementation of Airspace Concepts projects, the design of IFR Procedures and other actions adopted by DECEA for the optimization of Brazilian airspace.

2. AIRSPACE CONCEPTS PROJECTS AND IFR PROCEDURES FOR THE BRAZIL TMA

2.1 The Airspace Concepts (CEA) projects and their respective dates for implementation in the TMAs of Brazil are mentioned in the following table.

2.2 The projects: Efficiency Route and Cardel Nordeste were implemented on OCT 5, 2023 and the CEA Curitiba project was implemented on NOV 2, 2023.

Table 1 - Projects in Brazil

Brazil	Brasília		NOV 2015 (implemented)
	Belo Horizonte		NOV 2015 (implemented)
	São Paulo (partial changes)		NOV 2015 (implemented)
	Salvador		ABR 2017 (implemented)
	Manaus		AGO 2017 (implemented)
	(PBN SUL)	Curitiba	OCT 2017 (implemented)
		Florianópolis	
		Joinville	
		Navegantes	
		Porto Alegre	
		São Paulo (partial changes)	
		Rede de rota FIR CW	
	São Paulo (TMA-SP Neo)		MAY 2021 (implemented)
	TMA Belém (CCO/CDO – RNP com RF LEG)		DIC 2021 (implemented)
	TMA Campo Grande (CCO/CDO)		DIC 2021 (implemented)
FIR Recife (Proyecto Cardeal Nordeste)		OCT 2023 (implemented)	
FIR Brasília (Proyecto Eficiencia de Rutas)		OCT 2023 (implemented)	
FIR Curitiba (CEA Curitiba)		NOV 2023 (implemented)	
FIR Amazónica (ECO NORTE)		ABR 2025	
FIR Atlántico (rutas)		JUN 2030	

2.3 Tables 2 and 3 contain some information related to the results obtained from the projects: Efficiency Route, Cardeal Nordeste and Curitiba Airspace Concept (CEA).

Table 2- Efficiency Route and Cardeal Nordeste

NEW IAC/SID/STAR	187
NEW ENR-C	12
NEW ARC	5
AWY modified	127
Waypoints (new or modified)	1533
ATCO trained	672
evaluated city pairs	29
Number of operations/monthly (estimated)	6400
NM/monthly saved	7000
Fuel/monthly saved	36 TON
CO2 reduction/monthly	110 TON

Table 3- CEA Curitiba

NEW IAC/SID/STAR	65
NEW ENR-C	04
NEW ARC	01
NEW TMA	02

2.4 The next Airspace Concept projects are: new conception of airspace for the TMA of Cuiabá, TMA of Manaus and TMA of Belém. The Project is known as ECO NORTE.

2.5 The objectives of these projects are:

- a) Reduce CO2 emissions by designing more efficient trajectories;
- b) Reduce the complexity of the TMA Cuiabá, Belém and Manaus entrances; y

- c) Make the use of conditioned airspace more flexible in the region.

2.6 Other important information: Brazil has 1,442 IFR procedures (IAC, SID, STAR) published for 141 airports where IFR operations occur:

IAC		SID		STAR	
CONV	PBN	CONV	PBN	CONV	PBN
326	421	181	327	00	150
747		508		150	

OMNI 123 (compatible as conventional)*

2.7 Taking into account these IFR procedures (IFP), it is possible to carry out the pertinent analyzes of the implementation situation of the PBN concept and the CDO and CCO techniques in Brazilian airports:

APV / LNAV			STAR	SID	CDO TMA	CCO TMA
IAP APV	LNAV	IAP RNP AR	STAR PBN	SID PBN		
100%	100%	100%	100%	100%	100%	100%

3. PRODUCTION OF IFR PROCEDURES IN BRAZIL

3.1 The production of IFR procedures (IFP) remains intense to (1) satisfy the needs of Airspace Concepts projects, (2) incorporate NOTAM regarding procedures, (3) review those that are more than 5 years old and also (4) to develop new types of procedures, as explained below:

- a) Permanent NOTAMs (including procedures):
 - 61 Charts published until May to incorporate NOTAM
 - Objective: NOTAM PERM no more than 90 days.
- b) The number of procedures published by AMDT
 - 60 IFP/AMDT (May/2024)
- c) Elimination of Charts more than 5 years old:
 - 88 Charts expired (5 years) between JAN 2024 and DEC 2024
 - Objective: keep Charts no more than 4 years old
- d) New identification of IAC RNP APCH - from RNAV (GNSS) for RNP (100% updated)
- e) Publication of new types of procedures:
 - A-RNP;
 - IAC RNP APCH con RF LEG
 - Published for 3 AD (SBGO; SBJH, SBBE, SBSG)

- IAC RNP APCH for Visual Airports:
- 33 AD VFR
- IAC VPT (Visual Prescribed Track):
- SBVT

4. **SUGGESTED ACTIONS**

4.1 The meeting is invited to analyze the information provided, make comments and/or suggestions that may help in the development of airspace in Brazil to be aligned with what was adopted by the SAM States and with the recommendations of the Lima Office.

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