



Agenda Item 2: Report of activities of the GESEA and Subgroups

b) ATM implementation. Progress of the Subgroups

OPTIMIZATION OF AIRSPACE IN BRAZIL

(Presented by Brazil)

RESUMEN

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

Referencias:

- SAM/IG Meetings
- Meeting GREPECAS/18
- Doc 9613 – Performance-Based Navigation (PBN) Manual
- Doc 8168 – PANS-OPS/611, ICAO Volume I and II

1. Background

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 the operational safety and efficiency of air navigation in the SAM Region.

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

1.3. In this sense, this study note 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. Projects of airspace concepts and IFR procedures for Brazilian TMAS

2.1. The draft Airspace Concepts (AEC) and their respective dates for implementation in Brazil's EBAs are mentioned in the table below.

2.2. The changes in relation to the last meeting were the advances in the projects for the FIR Recife (Cardel Northeast Project), the FIR Brasilia (Route Efficiency Project) and the planning changes for the optimization of the other TMA for the years 2021 to 2030.

Brasil	Brasilia		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 Belem (CCO/CDO – RNP com RF LEG)		DIC 2021
	TMA Campo Grande (CCO/CDO)		DIC 2021
FIR Recife (Cardinal North East Project)		OCT 2023	
FIR Brasilia (Route Efficiency Project)		OCT 2023	
FIR Amazonica (Routes y TMA)		ABR 2025	
FIR Curitiba (Routes y TMA)		MAY 2027	
FIR Atlántico (Routes)		JUN 2030	

2.3. CEA project dates have been updated to meet the new airspace optimization demands in Brazil.

2.4. The Cardeal Northeast and Route Efficiency projects have started and are carried out in parallel, as they have areas with common boundaries.

2.5. The Cardeal Nordeste project aims to optimize air circulation in the TMAs of Recife, Natal and Fortaleza and increase airspace capacity. The activities developed and information of the project are the following:

- ✓ The new operational scenario has already been developed, considering more direct routes;
- ✓ The scenario has been evaluated in accelerated time simulation and the results are still being analyzed (adjustments will probably have to be made to achieve the proposed objectives);
- ✓ Production of 84 procedural letters (estimate);
- ✓ It is estimated (theoretically) a saving of more than 10,000 NM/year.

2.6. The Route Efficiency project aims to optimize air circulation in the Brasilia and Recife FIRs, seeking the use of the PBN concept to develop more direct routes, and increase airspace capacity. Air traffic will also be optimized in the TMA Porto Seguro, Ilhéus, Salvador, Aracajú and Maceió. The activities developed and information of the project are the following:

- ✓ The new operational scenario is being designed and evaluated in accelerated time simulation;
- ✓ Production of 126 procedural letters and 18 ENR/ARC (estimate);
- ✓ It is estimated (theoretically) a saving of more than 15,000 NM/year.

2.7. Other important information: Brazil has 1,442 (was 1,415) IFR procedures (IAC, SID, STAR) published for 141 airports where IFR operations occur:

IAC		SID		STAR	
CONV	PBN	CONV	PBN	CONV	PBN
393	328	205	327	02	160
721		532		162	

OMNI* 123 (compatible as conventional)

2.8. Taking into account these IFR (IFP) procedures, it is possible to carry out the pertinent analyses 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) in continues quite intense to (1) meet the needs of the Cardeal Nordeste and Route Efficiency projects, (2) incorporate NOTAM regarding procedures, (3) review those with more than 5 years and also (4) to develop new types of procedures, as explained below:

- a) 85% decrease in permanent NOTAMs (including procedures):
 - from 78 (DEC 2022) to 11 (DEC 2023)
 - 243 Letters published to incorporate NOTAM
 - Objective: NOTAM PERM no more than 90 days
- b) Decrease in the number of procedures published by WTDA:
 - from 68 (DEC 2022) to 47 IFP/AMDT (DEC 2023)
- c) Elimination of letters with more than 5 years:
 - Zero (DEC 2022)
 - 53 cards expired (5 years) between JAN 2022 and DEC 2023
 - Objective: keep cards with no maximum 4 years
- d) New identification of IAC RNP APCH - of RNAV(GNSS) for RNP (100% updated);
- e) Publication of new types of procedures:
 - SID RNP AR (SBRJ)
 - SID OMNIDIRECIONAL: published for 124 AD (21 AD missing)
 - IAC RNP APCH con RF LEG
 - Issued para 3 AD (SBGO; SBJH, SBBE)
 - Next AD: SBFZ, SBSG, SBRF y SBBR.

- IAC RNP APCH for Visual runways:
 - 18 AD VFR
 - 20 AD Seen the future
- IAC VPT (Visual Prescribed Track):
 - SBVT

3.2. DECEA is supporting DINACIA (Uruguay) with the design of procedures and airspace planning. The work started on 05/12/2022 and estimated a period of 180 days to develop procedures for the following airports: SUMU, SULS, SUCA, SUDU, SUSO, SURV, SUMO, SUPU, SUTB, SUAG:

- a) SUMU: 20 SID / STAR;
- b) SULS: 15 SID / STAR;
- c) 16 IAC.

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 in line with what has been adopted by the SAM States and with the recommendations of the Lima Office.

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