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**Twenty Seventh Workshop/Meeting of the ICAO SAM Implementation Grouop (SAM/IG/27) – Regional Project RLA/06/901**
(Virtual, 31 May to 3 June 2022)

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

**b) ATM implementation. Progress of Subgroups**

# AIRSPACE OPTIMIZATION IN BRAZIL

(Prepared by Brasil)

**SUMMARY**

The objective of this Working Paper is to present the update of the implementation of Airspace Concepts projects, design of IFR Procedures and other actions adopted by DECEA for the optimization of Brazilian airspace.

**References:**

- SAM/IG meetings
- GREPECAS/18 meeting
- Doc 9613 – Performance-Based Navigation (PBN) Manual
- Doc 8168 – PANS-OPS/611, VOL 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 safety and efficiency of air navigation in the SAM Region.

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

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

## 2. Airspace concepts projects and IFR procedures for Brazilian TMA

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

2.2 The changes in relation to the last meeting were regarding the end of the TMA SP Neo Project, the start of two new projects (Cardeal Nordeste Project for Recife FIR and Route Efficiency Project for Brasília FIR) and the planning changes for the optimization of the other TMAs for the years 2021 to 2030.

| | | | |
|---|---|---|---|
| Brasil | Brasília | | NOV 2015 (finished) |
| | Belo Horizonte | | NOV 2015 (finished) |
| | São Paulo (parcial changes) | | NOV 2015 (finished) |
| | Salvador | | ABR 2017 (finished) |
| | Manaus | | AGO 2017 (finished) |
| | (PBN SUL) | Curitiba | OCT 2017 (finished) |
| | | Florianópolis | |
| | | Joinville | |
| | | Navegantes | |
| | | Porto Alegre | |
| | | São Paulo (parcial changes) | |
| | | FIR CW routes | |
| | São Paulo (TMA-SP Neo) | | MAY 2021 (finished) |
| | TMA Belem (CCO/CDO – RNP with RF LEG) | | DIC 2021 |
| | TMA Campo Grande (CCO/CDO) | | DIC 2021 |
| | FIR Recife (Cardeal Nordeste project) | | OCT 2023 |
| | FIR Brasília (*Eficiência de Rotas* project) | | OCT 2023 |
| | FIR Amazonica (routes and TMA) | | ABR 2025 |
| | FIR Curitiba (routes and TMA) | | MAY 2027 |
| | FIR Atlantico (routes) | | JUN 2030 |

2.3 Airspace Concept project dates have been updated to meet new airspace optimization demands in Brazil.

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

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

- ✓ The new operational scenario has already been developed, considering specially more direct routes;
- ✓ The scenario has been evaluated in Fast Time Simulation and the results are still being analyzed (adjustments will probably have to be made to achieve the proposed objectives);
- ✓ Production of 112 IFP charts (estimated);
- ✓ It is estimated (theoretically) a saving of more than 10,000 NM/year.

2.6 The "*Eficiência de Rotas*" project aims to optimize air traffic in the Brasília and Recife FIRs, seeking to use the PBN concept to develop more direct routes and increase airspace capacity. Air circulation in the Porto Seguro, Ilhéus, Salvador, Aracajú and Maceió TMAs will also be optimized. The activities carried out and project information:

- ✓ The new operational scenario is being developed (90%) and will later be evaluated in Fast Time Simulation;
- ✓ Production of 95 IFP charts and 18 ENR/ARC (estimated);
- ✓ It is estimated (theoretically) a saving of more than 15,000 NM/year.

2.7 Other important information: Brazil has 1,442 (was 1,524) IFR procedures (IAC, SID, STAR) published for 141 airports where IFR operations occur:

| IAC | | SID | | STAR | |
|---|---|---|---|---|---|
| CONV | PBN | CONV | PBN | CONV | PBN |

| | | | | | |
|---|---|---|---|---|---|
| 345 | 356 | 244 | 342 | 02 | 153 |
| 701 | | 586 | | 155 | |

2.8 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 of 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 2020 faced great difficulties, due to the procedures adopted in Brazil to deal with the pandemic caused by COVID-19.

3.2 Isolation measures, remote meetings and work, and cases of withdrawal of personnel due to contamination with COVID-19, imposed a great challenge to maintain the level of productivity to meet the needs of users by IFR procedures.

3.3 However, some measures were taken to keep the service active and take advantage of the decrease in flights to address old pending issues and other specific demands of new types of IFP in Brazil.

3.4 The largest investment was in providing means for remote access to workstations and thus allowing specialists to continue working from their homes.

3.5 Adjustments were also made in the processes, training of other specialists to help in production, re-prioritization of jobs and establishment of "task groups" to meet specific demands, such as reducing the number of permanent NOTAMs on IFR procedures.

3.6 The results were very positive and ended up surprising the initial expectation of having a 2020/2021 year with setbacks in IFP's productivity. The main achievements were the following:

a) 80% decrease in permanent NOTAMs (including procedures):
   - ✓ from 1,101 (DEC 2019) to 225 (DEC 2021)
   - ✓ 1,149 charts published to incorporate NOTAM
   - ✓ Goal: NOTAM PERM no more than 90 days

b) Increase in the number of procedures published by AMDT:
   - ✓ from 33 IFP / AMDT (DEC 2019) to 67 (AUG 2021)

c) 93% reduction in charts older than 5 years:
   - ✓ from 773 (JAN 2020) to 56 (DEC 2021)
   - ✓ 407 charts expired (5 years) between JAN 2020 and DEC 2021
   - ✓ Goal: keep chats with no maximum 4 years

d) New standard to treat obstacle penetrations in the VSS;

e) New identification of RNP APCH procedures - from RNAV (GNSS) to RNP;

f) Publication of new types of procedures:
   - ✓ SID RNP AR (SBRJ)
   - ✓ OMNIDIRETIONAL SID: published for 79 AD (66 AD missing)

- ✓ IAC RNP APCH with RF LEG
  - Posted for 2 AD (SBGO; SBJH)
  - Next AD: SBBE; SBFZ and SBBR.
- ✓ IAC RNP APCH for VFR AD:
  - 03 AD VFR (SBSV; SBIL; SBAG)
  - Next AD: SWLC; SBCH; SBUG; SBUF; SBTG; SWPI; SNBR; SWGN.

4. **Suggested actions**

4.1 The Meeting is invited to:

a) Take note and review the information provided in this Working Paper and evaluate if Brazilian standards could be implemented on your own States; and

b) Make comments and suggestions that may help in the development of airspace in Brazil to be in line with what is adopted by the SAM States and with the recommendations of the Lima Office.

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