



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

**CRITERIA FOR THE IMPLEMENTATION OF ADVANCED RNP (ARNP)
(IAC and SID) IN BRAZIL**

(Presented by Brazil)

SUMMARY

This Working Paper presents the initiative of the Department of Airspace Control (DECEA), through an ad hoc group of the Airspace Planning Study Group (GEPEA), to implement IFR arrival, approach and departure procedures based on the ADVANCED RNP concept. Some advantages: reduction of nautical mile (NM) in flight due to RF Leg capability, reduction of CO2 emission and offset navigation capability.

REFERENCES

- GEPEA Meetings, BRAZIL
- Doc 8168 Vol. II PANS-OPS, 20th ed
- Doc 9613, 5th ed

1. INTRODUCTION

1.1 Doc 8168, Volume II, Construction of Visual and Instrument Flight Procedures, includes design criteria to assist States in the implementation of Advanced RNP (A-RNP) approach procedures.

1.2 A-RNP procedures can provide significant operational and safety advantages over other Area Navigation (RNAV) procedures by incorporating additional navigational precision, integrity and functional capabilities to enable operations using reduced obstacle protection tolerances that allow the implementation of approach and departure procedures in circumstances where other types of procedures are not operationally possible or satisfactory.

1.3 Some States, for example Chile, began to publish A-RNP approach procedures to overcome difficulties in difficult terrain and to increase access to some airports. This is possible because A-RNP enables the encompass of high-quality lateral and vertical navigation (VNAV) capabilities and provides improvements in operational safety and reduced risks of controlled flight in terrain.

2. THE A-RNP SPECIFICATIONS:

- a) 0,3 NM on final approach;
- b) 1 o 2 NM on continental route;
- c) 1 NM in SID, STAR;
- d) Optional requirements include applications for oceanic/remote airspace and an

increment option that allows any navigation accuracy value between 1.0 NM and 0.3 NM, in 0.1 NM increments, in all terminal phases of the flight except on final approach.

The A-RNP operation comprises the operations listed in the table below and, therefore, an aircraft must be capable of meeting all the criteria required by those operations. In addition, the RF segment execution capabilities and parallel displacement functions.

Table 1- SPECIFICATIONS

SPECIFICATION
RNAV 5
RNAV 1 e 2
RNP 2
RNP 1
RNP APCH

3. **AUTHORIZATIONS**

3.1 The flexibility of A-RNP operation significantly reduces the number of authorizations required for the various existing navigation specifications.

4. **BRAZILIAN INITIATIVE FOR A-RNP IMPLEMENTATION**

4.1 Taking into account the growing demand from airspace users for the implementation of more flexible Procedures and based on the initial requirements developed by the PBN group, the Department of Airspace Control (DECEA), through an ad group hoc of the Airspace Planning Study Group (GEPEA), decided to: initiate studies for design and charting, for A-RNP arrivals, approaches and departures.

4.2 This initiative also considered the best international practices used by some States to publish their own procedures, also considering the need to increase accessibility at airports where the Advanced RNP (A-RNP) concept was already being applied.

4.3 This project began in 2023 and the airport chosen to be the first to receive A-RNP approach was Guarulhos Airport (GRU). The decision to implement this type of procedures at this airport was because it presents the greatest challenge to overcome, in terms of obstacles and the one that will bring the most benefits for the airlines that operate at GRU.



Figure 1 – Guarulhos Airport - SP

4.4
in Brazil:

The following tasks have been carried out so far to implement the A-RNP approach

- a) Coordination and consultations with experts from other countries where Advanced RNP approaches are already being carried out;
- b) Implementation process based on the focus on the CDM concept, involving the various stakeholders, especially the civil aviation authority, airlines and air navigation service providers (ANSP);
- c) Development of a prototype procedure and conducting evaluations using airline simulators;
- d) Discussions with the civil aviation authority to develop the requirements that must be addressed during the operational approval process.

4.5
Advanced approach prototype were the following:

- a) Bank angle: 25 degrees;
- b) A- RNP 0.3;
- c) Use of RF legs.

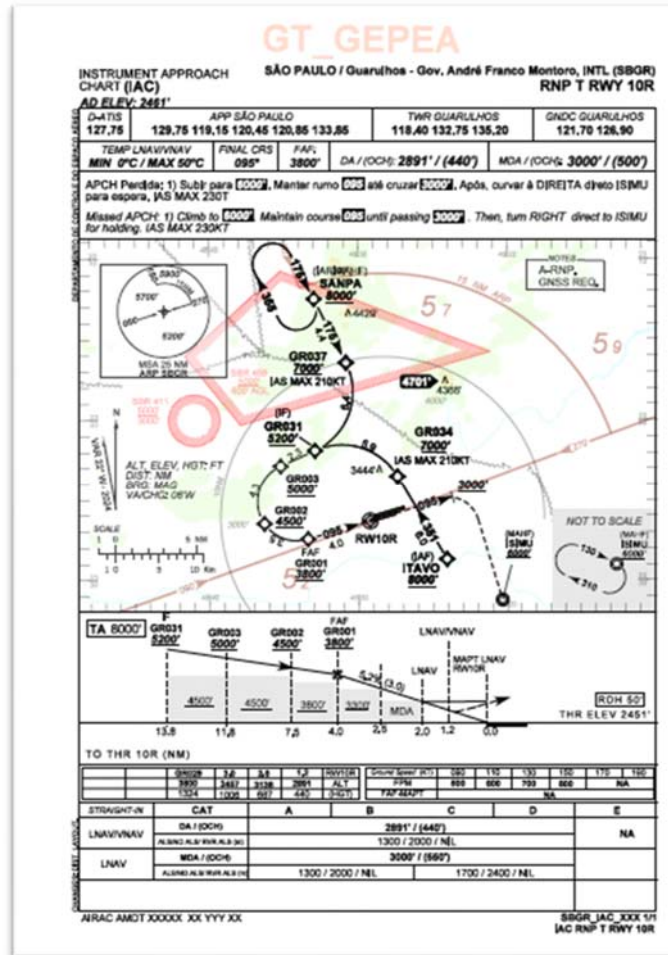


Figure 2 – A-RNP Approach

DRAFT OF CHART

5. Implementation Proposal in the SAM Region

5.1 Several States are already publishing A-RNP Procedures to achieve benefits in operations at their airports, especially in terms of accessibility. Brazil's experience in this regard could help SAM States implement their own procedures and be aligned with ICAO's intention to improve global PBN implementation.

6. Suggested actions

6.1 The Meeting is invited to:

- a) Take note and review the provided information; and
- b) Discuss and approve the development strategy for A-RNP implementation.