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**International Civil Aviation Organization
UNDP/ICAO Regional Project RLA/98/003
Transition to CNS/ATM Systems in the CAR and SAM Regions**

**Tenth Meeting/Workshop of ATM Authorities and Planners
of the CAR/SAM Regions (AP/ATM/10)**

(Lima, Perú, from 10 to 14 May 2005)

- Agenda Item 1: RNAV Routes Implementation Programme in the CAR/SAM Regions**
- c) RNAV Routes Implementation in the TMAs of the CAR/SAM Regions**
- RNAV SIDs/STARs Implementation in CAR/SAM TMAs**

(Presented by the Secretariat)

Summary

This working paper contains information on the Implementation of RNAV Standard Instrument Departure/Arrival Routes (SIDs/STARs) in the CAR/SAM TMAs.

1. Introduction

1.1 The RNAV Routes Implementation Programme in the CAR/SAM Regions has been underway for the last three years, and is currently in the first stages of implementation of Phase II-b. During that period of time, the diverse regional meetings under the scope of GREPECAS have approved various conclusions aimed at the implementation, by CAR/SAM Administrations, of RNAV SIDs/STARs in their respective TMAs, in order to link RNAV routes to the corresponding airports located both at the beginning and at the end of the route, as well as in the required intermediate segments.

1.2 The CAR/SAM Air Navigation Plan (ANP), FASID, in the ATM Evolution Tables – TMA operations, envisages the implementation of RNAV SIDs/STARs with their corresponding RNP requirements by 2002.

1.3 However, according to the information provided by CAR/SAM Administrations, and despite the fact that 40 RNAV routes have already been implemented, the implementation of RNAV SIDs/STARs has not occurred in most TMAs of both Regions.

2. Analysis

2.1 The implementation of RNAV SID/STARs requires a clear and precise definition of RNP values to be applied in the corresponding TMAs, so that, in addition to linking airports to long-range RNAV routes, they can also be linked with the respective instrument approach procedures.

2.2 Except for RNAV routes in the EUR/SAM and Santiago de Chile-Lima corridors, the remaining CAR/SAM RNAV routes implemented so far have not yet been assigned a specific RNP value; therefore, pursuant to ICAO Annex 11, Attachment B, these RNAV routes should have an RNP value based on existing use, that is, on prolonged operational experience.

2.3 The amendment to the CAR/SAM Regional Plan for CNS/ATM Systems, ATM Evolution Tables – En route operations, approved by GREPECAS/12 in June 2004, contemplates the implementation of RNP with values to be defined between RNP 4 and RNP 5.

2.4 The ICAO Air Navigation Commission (ANC), recognising the importance and high priority assigned to the study of RNP, has created a new Required Navigation Performance and Special Operational Requirements Study Group (RNPSORSG), whose objectives are: to review the RNP concept and, if appropriate, its use as single means to express navigation requirements for each flight phase; and to reach a consensus on the functional requirements associated with the various precision levels. This Study Group has recently begun its discussions and is expected to submit its results to the ANC shortly and, subsequently, to the ICAO Council, for approval.

2.5 On the other hand, through **Decision ATM/3/9**, the ATM Committee of the GREPECAS ATM/CNS Subgroup (ATM/CNS/SG) requested that the CNS Committee report at the upcoming ATM/CNS/SG/4 meeting if the GPS meets the operational requirements for use in RNAV routes without applying RNP; in RNAV routes with RNP 4 and RNP 5 values; and in TMAs.

2.6 In view of the above, ICAO conducted an RNAV seminar for the CAR/SAM Regions in Sao José dos Campos, Brazil, on 29 November - 3 December 2004. The purpose of this seminar was to provide the States with a better understanding of the implementation aspects related to RNAV and RNP instrument flight procedures. The seminar focused on the design process, and on quality assurance aspects, which are important for the integrity of the information contained in the aircraft navigation database.

2.7 In order to provide CAR/SAM Administrations with general information on RNP application, there are plans to conduct the *II Seminar on RNP Implementation, in Lima, Peru, on 26-27 September 2005*, sponsored by Project RLA/98/003, to present the guidelines on airworthiness, operations, navigation precision performance keeping and monitoring approval requirements, which will allow the formulation of guidelines for drafting the *CAR/SAM RNP implementation action plan*, and the *Guidelines for the implementation of RNAV SID/STARs in TMAs*.

3. Suggested action

3.1 The meeting is invited to take note of the information provided in this working paper and to urge CAR/SAM Administrations to continue participating in all the activities related to this matter.