

***AIR NAVIGATION  
PLAN/REGIONAL PERSPECTIVE  
IMPLEMENTATION OF  
CNS/ATM SYSTEMS***



**Carlos Stehli – Deputy Regional Director  
ICAO SAM Office**

# CONTENTS

- ***ICAO REGIONAL OFFICES - OBJECTIVE***
- ***REGIONAL AIR NAVIGATION PLAN***
- ***AIR NAVIGATION PLAN IMPLEMENTATION MECHANISMS***
- ***DEVELOPMENTS OF CNS/ATM SYSTEMS***
- ***CONCLUSIONS***



# ***ICAO REGIONAL OFFICES - OBJECTIVE***

***The objective of Regional Offices is identical to that of the Organization as a whole***

“Meet the needs of the peoples of the world for safe, regular, efficient and economical air transport (Art. 44, Convention of Chicago)”

- ***Share the Organization's vision and mission***
- ***Represent ICAO Secretary General to the States to which they are accredited.***
- ***Conduct regional programmes maintaining continuous communication with States and Regional Organizations for the implementation of policies, SARPs and regional air navigation plans.***

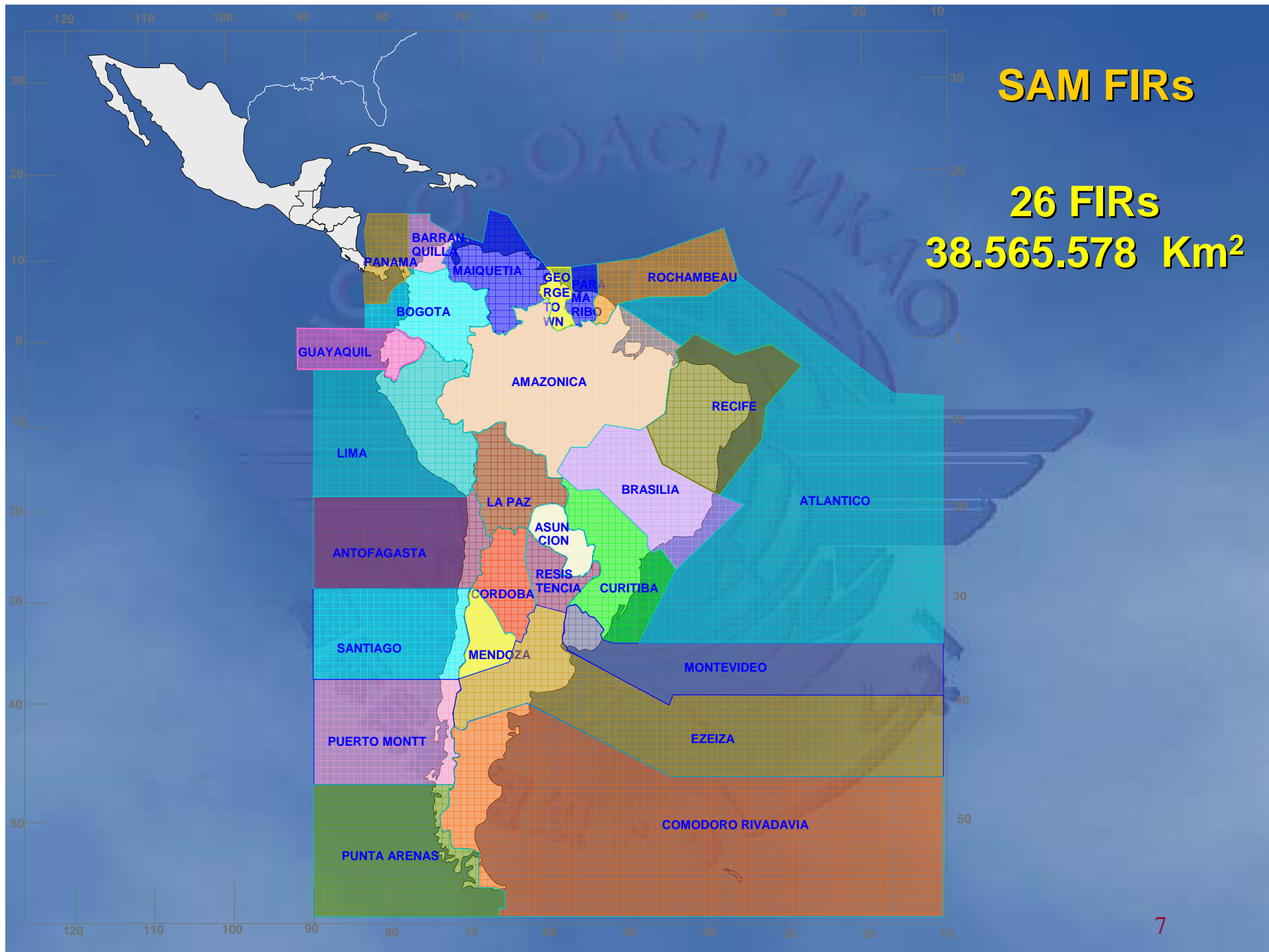


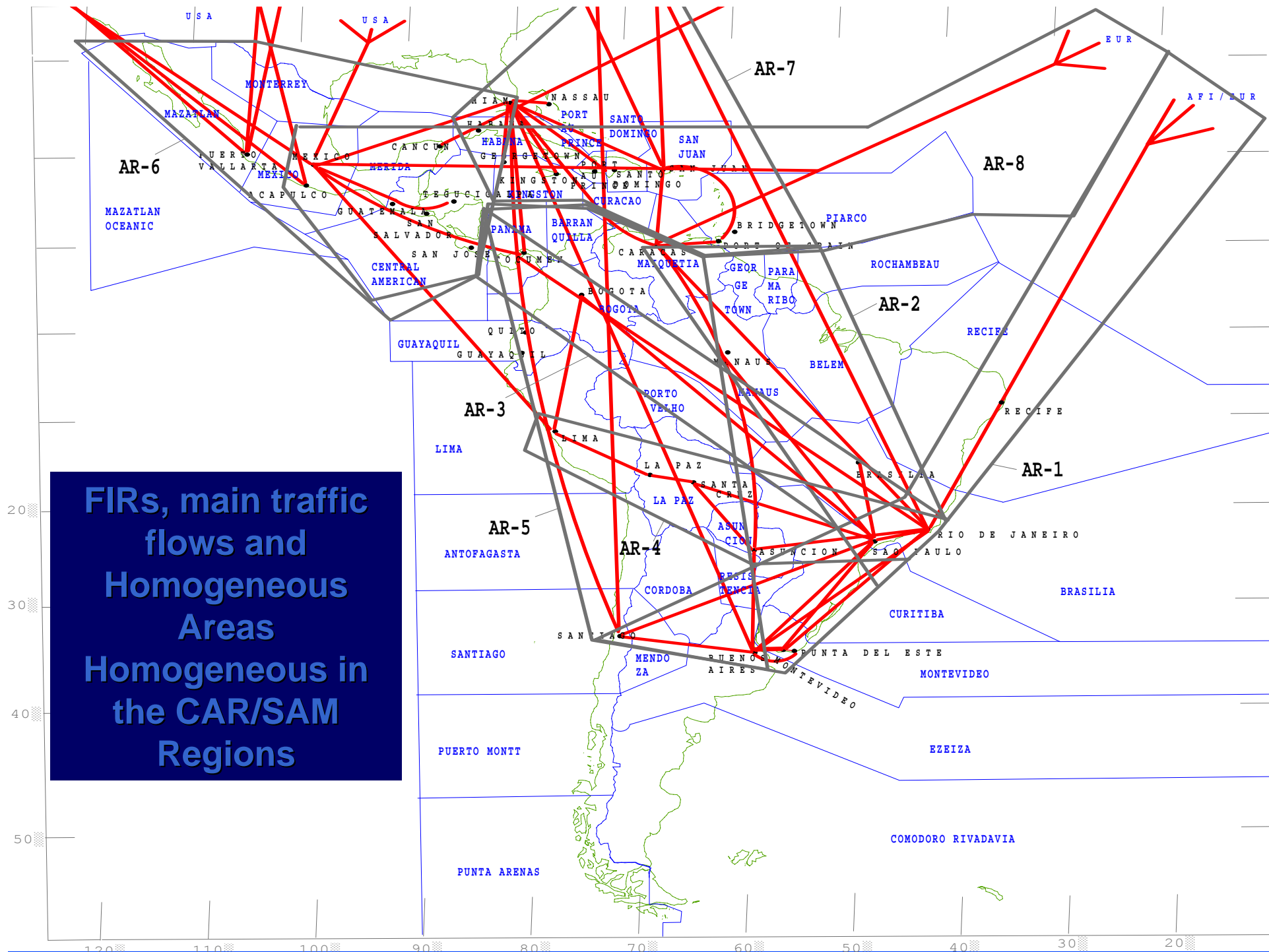
# ***REGIONAL AIR NAVIGATION PLAN***

## ***CAR/SAM ANP, Doc. 8733***

- **Document approved by the Council and published under the authority of the Secretary General.**
- **Contains in detail the facilities, services and procedures to be provided by States according to Art. 28 to the Convention of Chicago.**
- **Formulated by the Regional Air Navigation Meetings (RAN) in two Volumes:**
  - Vol I – BASIC ANP**
    - Permanent principles within planning horizon**
    - AREAS: GEN, BORPC, AOP, AIS/MAP, ATM, CNS, MET, SAR**
  - VOL II – FASID**
    - Requirements subject to the dynamic of the implementation process**
    - AREAS: GEN, AOP, AIS/MAP, ATM, CNS, MET, SAR**
- **Revised and updated by GREPECAS.**
- **In current process of integration with the Global Air Navigation Plan (GANP) – eANP**
- **Fundamental planning document for the implementation of the Global/Regional ATM System**









# AOP

➤ **Basic – Required international aerodromes**

➤ **FASID –AOP Table**

- 1. Aerodromes by State**
- 2. Alternative aerodromes**
- 3. RFF Service**
- 4. ATS Requirements**
- 5. Physical Characteristics**
- 6. Radio-aids**
- 7. Lighting-aids**
- 8. Signals**
- 9. RVR**

# CNS

- **BASIC – Planning criteria and regional recommendations for CNS systems (in process of amendment).**
- **FASID – CNS Tables**
  - 1. Aeronautic Fix Service (AFS)**
    - 1.1** Table CNS 1A - AFTN (Doc. 8259)
    - 1.2** Table CNS 1B – Plan ATN (In process of amendment).
    - 1.3** Table CNS 1C – ATS Oral Circuits.  
Digital South American Network (REDDIG), MEVA II, COCESNA Network, CAFSAT - cover AFS requisites
  - 2. Aeronautical Mobile Service (AMS (R))**
    - 2.1** Table CNS 2 A (VHF 25 KHz of channels separation, data link requirements (VDL, HF/SSB; Mode S, AMSS, HFDL)).  
Air-to-Air Channel 123.400 MHz. 136 – 137 MHz separated for VDL air-ground.
    - 2.2** Table CNS 2 B, HF/SSB Communications Service in route. Frequencies families in the bands from 2 to 22 MHz

# CNS

## ➤ FASID – CNS Tables (cont.)

### 3. Aeronautical Navigation Radio Service

#### 3.1 Table CNS 3 – Navigation Radio Aids (in process of amendment)

Radio navigation systems are being examined in order to support the PBN implementation. Current plans for RNAV-5 (continental) RNP10/RNP4 (oceanic) for In-route navigation and RNAV1/RNP1 for Terminal navigation

While GNSS is established and during transition, VOR/DME will be used.

ILS will be retained until its use is operationally and economically acceptable.

### 4. Surveillance Service

#### 4.1 Table CNS 4 – Surveillance Systems (PSR, SSR, ADS-C)

The Regional Strategy is under preparation in the light of new technologies, such as, Multilateration and ADS-B,.

Programmes to develop ADS-B regional trials. Surveillance data exchange.

## ATM

- **Basic:** Routes Network - Table ATS 1.  
Under Project RLA/06/901 a restructuration of routes network is being studied in order to rationalize this and to apply PBN concepts
- **FASID:** ATM evolution tables (to be updated by GREPECAS)  
SSR codes assignment plan.

## SAR

- **Basic:** Plan for the Search and Rescue Regions (SRR)  
– SAR Chart
- **FASID:** Search and Rescue facilities

# AIS/MAP

- **Basic:** Guidance material and recommendations for AIS/MAP implementation/planning. A concept of an integrated automated AIS system.
- **FASID:** Requisites regarding facilities and services.
  1. Table AIS 1-Aerodrome AIS/MAP Services Organization
  2. Table AIS 2-Services to be provided in aerodromes
  3. Table AIS 3/Chart AIS 1- NOF Requisites
  4. Table AIS 4- Availability of elements of the integrated aeronautical information package in other States
  5. Table AIS 5-Requisites for WGS-84
  6. Table AIS 6-Requisites for aeronautical charts production
  7. Table AIS 7/Chart AIS 2-Responsibilities for the production of sheets of the series of ICAO world aeronautical chart 1:1000000.
  8. Table AIS 8- Requisites of the integrated aeronautical information package



## MET

- **Basic:** Basic planning criteria of aeronautical meteorology
- **FASID:** Requisites for facilities and services.
  1. Tables MET 1A/1B Services required in Aerodromes and WMO requisites
  2. Tables MET 2A OPMET Information required in ISCS and | SADIS
  3. Table MET 2B CAR/SAM OPMET Exchanges
  4. Table MET 3A/Chart MET 1- Tropical Cyclones Advisory Centres (TCAC).
  5. Table MET 3B/Chart MET 2- Volcanic Ashes Advisory Centres (VAAC).
  6. Table MET 3C – Selected State Volcano Observatories
  7. Tables MET5/6 - WAFS products requirements/WAFS responsibilities
  8. Table MET 7- ISCS/1 Users, VSAT equipment and access

# Global Air Navigation Plan (GANP) (Doc.9750)

*Document of global planning in support to the development of ICAO Strategic Objectives, related to the efficiency of air operations, which presents a strategy to achieve a transition towards global ATM in an evolutionary and harmonized manner.*

- ✓ Covers all aspects contemplated in air navigation services
- ✓ Was developed in coordination with the industry and the States
- ✓ Contains 23 operational initiatives (GPIs) which allow to support the planning/implementation of ATM improvements at short and medium term.
- ✓ Will integrate current CNS/ATM regional plans
- ✓ Harmonized with the GASP
- ✓ Regional planning/implementation tool-PIRGs

GREPECAS



# ***AIR NAVIGATION PLAN IMPLEMENTATION MECHANISMS***

# **IMPLEMENTATION MECHANISMS AVAILABLE**

## **1. Internal**

Correspondence, Meetings, Seminars, Workshops/Courses, Special Implementation Projects (SIPs), assistance on multinational systems.

## **2. Use of ICAO technical cooperation**

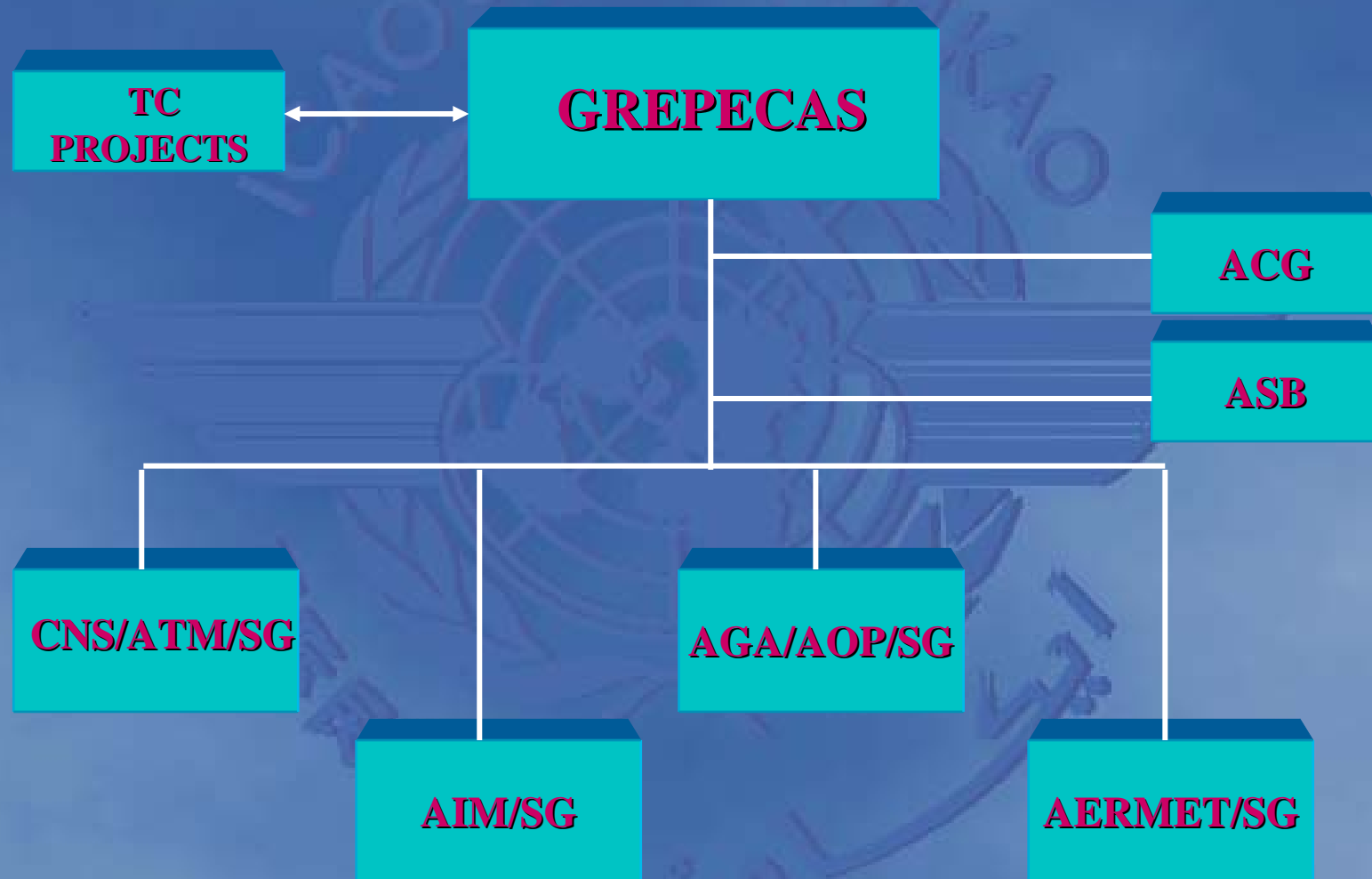
Regional Projects, National Projects

## **3. Support to Planning and Implementation Groups (PIRGs)**


GREPECAS

**Consultations and dissemination of information through the Organizations' and Regional Offices' web sites ([www.lima.icao.int](http://www.lima.icao.int))**

# GREPECAS – CURRENT STRUCTURE (GREPECAS/15)





The background of the slide features a large, faint, light blue watermark of the International Civil Aviation Organization (ICAO) logo. The logo is circular, with a globe in the center showing latitude and longitude lines. The globe is flanked by two olive branches. The text "ICAO" is written in a large, serif font at the top, and "OACI" is written in a similar font at the bottom. The Chinese characters "国际民航组织" are also visible at the bottom.

# ***DEVELOPMENT OF REGIONAL CNS/ATM SYSTEMS***

# REGIONAL AIR NAVIGATION SYSTEM

## 1. THE CURRENT SYSTEM COMPRISE

### Conventional systems

AFTN, ATS SPEECH circuits,  
VOR/DME/ILS/NDB, SSR

mainly manual procedures are apply

Low degree of automation

CNS/ATM systems in development (data link, GPS procedures, development of RNAV, RVSM, RNP10 routes)

## 2. THE FUTURE SYSTEM WILL COMPRISE

Progressive use of the GANP GPIs towards a performance standards based system, in accordance with the ATM operational concept

## 3. IMPLEMENTATION HORIZON

25 years starting in 2000

# ACHIEVEMENTS IN THE IMPLEMENTATION OF CNS/ATM TECHNOLOGY

## CNS technology

- ✓ Regional Digital Networks – REDDIG, MEVA and COCESNA as multinational systems
- ✓ National Digital Networks
- ✓ AMHS
- ✓ Air/Ground and ATIS-D data links
- ✓ SBAS trial platform and results of ionosphere studies. GBAS trials
- ✓ Radar data exchange
- ✓ ATM automation programme

## ATM achieved improvements

- ✓ Review of ATS routes structure
- ✓ Implementation of RNAV, RNP10 and RVSM routes

# SHORT AND MEDIUM TERM FUTURE PLANNING

- **Strategy**
  - ✓ Use of Global Air Navigation Plan and harmonized Regional Plans - eANP
  - ✓ Events of information sharing and instruction- PBA
  - ✓ Technical Cooperation
  - ✓ Multinational Systems Implementation (OMR)
- **Regional Operational Initiatives**
  - ✓ Air Traffic Flow Management (ATFM)
  - ✓ Performance Based Navigation (PBN)
  - ✓ ATS Air routes Optimización
  - ✓ SMS/QMS
- **Technology support**
  - ✓ Progressive implementation of CAR/SAM ATN Plan
  - ✓ Data link between ATS dependencies (AMHS, AIDC)
  - ✓ Air/ground data link and CPDLC/ADS-C/B applications
  - ✓ ATM/AIM automation
  - ✓ Use/implementation of GNSS – ABAS, GBAS technology

## GOALS PROPOSED TO BEGINN WITH THE IMPLEMENTATION TOWARDS GLOBAL ATM IN THE REGION

### ➤ **Proposed horizon for the next 5 years**

PBN - RNAV-5

Strategic ATFM - ATFM in airports

MET/AIM - (Quality Management System) QMS

COMMUNICATIONS - AMHS

Argentina, Brazil, Peru, Colombia, Ecuador, Paraguay

ATM AUTOMATION

Radar data interchange, AIDC/OLDI

SURVEILLANCE-Pre-operational ADS-B Trials, Multilateration

REDDIG IMPROVEMENTS

Satellite segment increase, Re-structure

MEVA II/REDDIG interconnection.

OMR IMPLEMENTATION IN THE SAM REGION

### ➤ **Main tools** - RLA/06/901, RLA/03/902, new project for OMR

### ➤ **Cost/benefit studies**



# CONCLUSIONS

- **CAR/SAM Regions move ahead towards Global/Regional ATM**
- **CAR/SAR Air Navigation Plan is continuously being reviewed by GREPECAS in correspondence to ICAO guidelines regarding transition towards Global/Regional ATM system.**
- **GREPECAS is progressively re-shaped to develop its work based on a performance approach (PBA).**
- **In CAR/SAM Regions, significant CNS/ATM improvement has been made, and GANP initiatives have been identified, in order to continue progressing towards the global ATM system.**
- **ICAO Regional Offices have developed an implementation programme for the CAR/SAM Regions, with technical cooperation tools established for advising States in matters of CNS/ATM implementation towards global ATM system.**

The background of the slide features a large, faint, light blue watermark of the International Civil Aviation Organization (ICAO) seal. The seal is circular, with the acronym 'ICAO' and its Chinese equivalent '国际民航组织' (Gují Mínháng Zǔzhī) around the top and bottom edges. The center of the seal depicts a globe with latitude and longitude lines, flanked by two olive branches.

***THANK YOU  
VERY MUCH !!!***