Second Seminar on RVSM Implementation in the CARS/SAM Regions

(Panama, Panama, 16 and 17 June 2002)

UNDP /ICAO TC Project RLA/98003

"Transition to the CNS/ATM Systems in the CAR/SAM Regions"

José Moreno

RLA/98/003

- V Meeting CAR/SAM Civil Aviation Authorities
- GREPECAS VI
- May 1999 : Initial activities
- 11 States and 1 International Organization

Argentina	Colombia	Peru
Bolivia	Ecuador	USA
Brasil	Panama	Venezuela
Chile	Paraguay	COCESNA

RLA/98/003

Objectives

- CNS/ATM Implementation and evolutionary improvements
- WGS 84 Implementation
- System Automation
- Institutional and economic considerations
- Organize appropiate meetings, workshops and seminars

RLA/98/003

ATM

- TRAFFIC FLOWS ANALYSIS
- RNAV ROUTES, RNP and RVSM IMPLEMENTATION

ANALYSIS of MAIN TRAFFIC FLOWS

- 18 TFs in CAR/SAM Regional ANP (FASID);
- **Phase I**
  - ✓TF 9 Sao Paulo-Río de Janeiro/Miami
  - ✓TF 10 Sao Paulo-Río de Janeiro/New York
  - ✓TF 11 Buenos Aires/New York

ANALYSIS of MAIN TRAFFIC FLOWS (Cont.)

- **Phase II**

  - ✓TF 4 Sao Paulo-Río de Janeiro/Europe
  - ✓TF 6 Santiago-Lima/Los Angeles
  - ✓TF 7 Santiago-Lima/Miami
  - ✓TF 8 Sao Paulo-Río de Janeiro/Miami
  - ✓TF 12 Buenos Aires/Miami
  - ✓TF 15 Mexico/Dallas-Houston-Miami-Los Angeles

ANALYSIS of MAIN TRAFFIC FLOWS (Cont.)

- **Phase III**

  - ✓ TF 1 Santiago/Buenos Aires-Montevideo
  - ✓ TF 2 Buenos Aires/Sao Paulo-Río de Janeiro
  - ✓ TF 3 Santiago/Sao Paulo
  - ✓ TF 5 Lima/Sao Paulo-Río de Janeiro
  - ✓ TF 13 North South America/Europe
  - ✓ TF 14 Mexico/Europe
  - ✓ TF 16 Central America/Europe
  - ✓ TF 17 South America/South Africa
  - ✓ TF 18 Santiago/Easter Island-Papeete

ANALYSIS of MAIN TRAFFIC FLOWS (Cont.)

ATM evolution in Traffic Flows

- ✓ 10 minutes minimum longitudinal separation
- ✓ RNAV routes
- ✓ Parallel RNAV RNP 10 (50 NM route spacing)
- ✓ RNP 10 - 50 NM RNAV longitudinal separation
- ✓ RVSM

PRE-OPERATIONAL IMPLEMETATION

"GREPECAS planning endorsed by RAN CAR/SAM/3 Selected city pairs"

Objectives:

- ✓ **Identify problems during implementation**
- ✓ **Enable users to utilize avionics installed**
- ✓ **Reduce flight time and obtain fuel savings**
- ✓ **Apply 10 minutes and/or 80 NM MNT longitudinal separation**
- ✓ **RNP and RVSM**

PRE-OPERATIONAL IMPLEMETATION (Cont.)

Tasks

- **Analyze Pre-operational RNAV routes**
- **Determine requirements**
- **Review Letters of Operational Agreement**
- **Develop Implementation Programme**

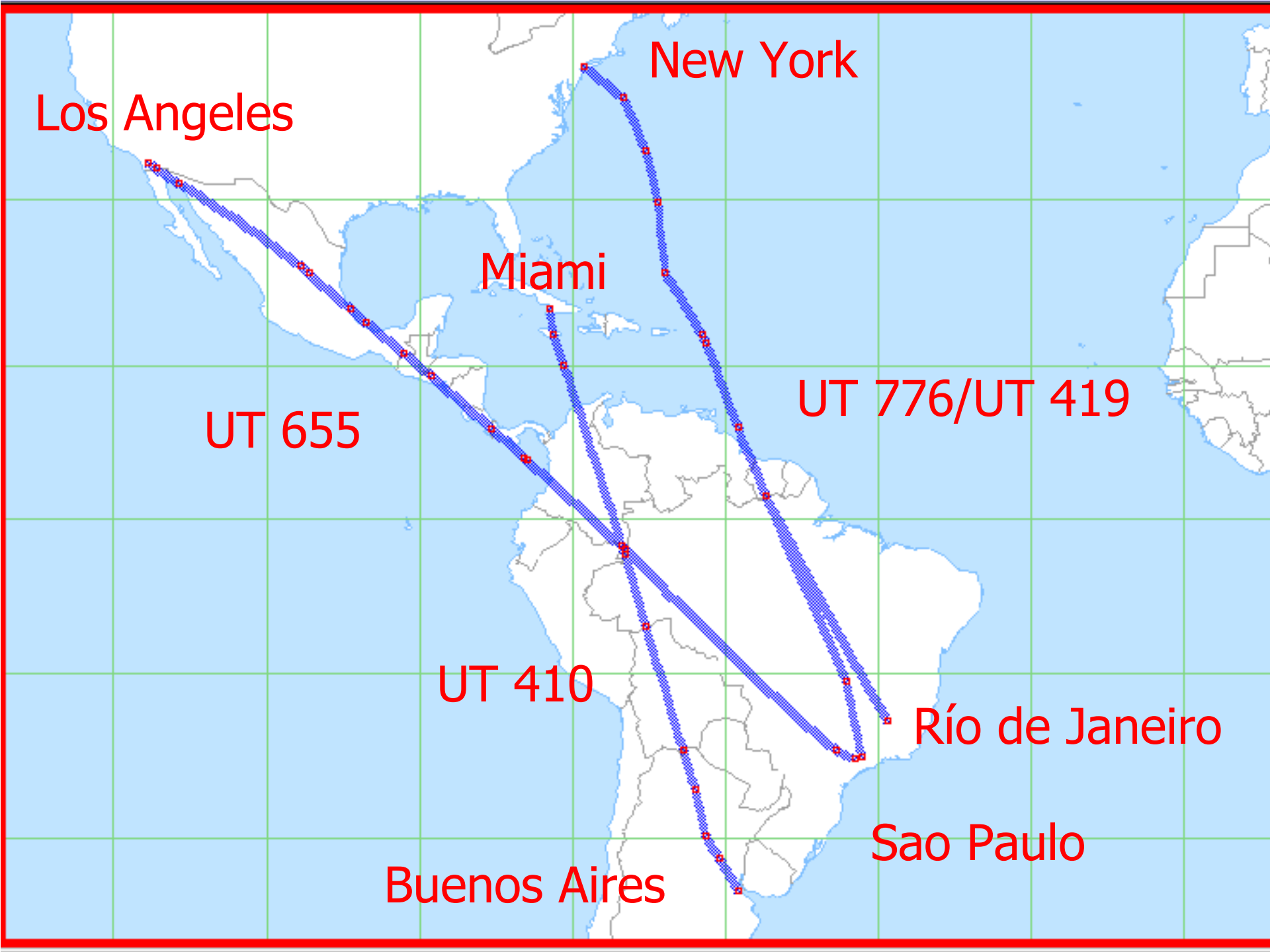
First ATM Authorities and Planners Meeting – Workshop (AP/ATM/1) July 2000

- ✓ Santiago - Lima/Miami: UT 780
- ✓ Sao Paulo - Rio de Janeiro/Miami: UT 795 and UT 799


Miami
UL 795
UL 780
Sao Paulo
Santiago de Chile

AP/ATM/2, Lima, Peru, May 2001

- Buenos Aires/Miami: UT 410
- Sao Paulo-Rio de Janeiro/Los Angeles: UT 655
- Sao Paulo-Rio de Janeiro/New York: UT 776 and UT 419


New York
Los Angeles
Miami
UT 776/UT 419
UT 655
UT 410
Río de Janeiro
Sao Paulo
Buenos Aires

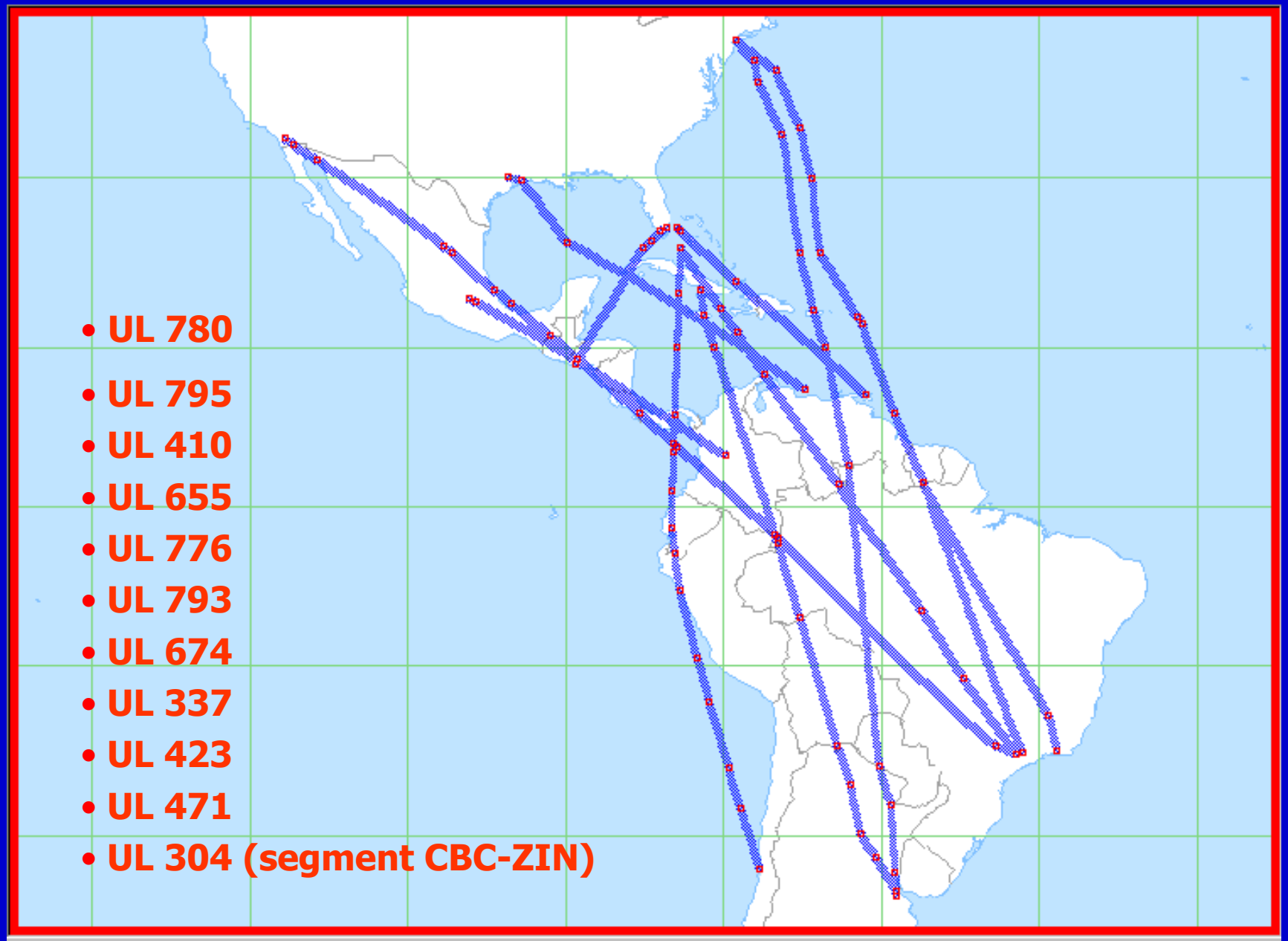
AP/ATM/3 (May 2002)

- Amendment CAR/SAM ANP - Basic Volume

- IMPLEMENTATION (NO TRIALS) of NEW RNAV routes two AIRAC periods after amendment approval by ICAO's COUNCIL:
  - **UL 793 (Buenos Aires/New York)**
  - **UL 674 (Caracas/Houston)**
  - **UL 337 (Por of Spain/Miami)**
  - **UL 423 (Bogotá/San José/México)**
  - **UL 471 (San Salvador/ /Miami)**

UL 793-UL 674-UL 337-UL 423 and UL 471

11 RNAV ROUTES IMPLEMENTED



- UL 780
- UL 795
- UL 410
- UL 655
- UL 776
- UL 793
- UL 674
- UL 337
- UL 423
- UL 471
- UL 304 (segment CBC-ZIN)

EVALUATION of RNAV ROUTES IMPLEMENTATION

Dificulties during Implementation Process

- SID/STAR not implemented within some TMAs
- Prohibited/restricted airspace and one point entry only in some States: **Parallel routes not implemented**
- Some States required RNAV routes follow existing routes in some FIRs: **Non Orthodromic RNAV routes**
- Segments routes overlap existing routes: **elimination of some existing routes or segments of routes**
- Mountaneous Areas: **Operational restrictions, therefore Non Orthodromic RNAV routes**

EVALUATION of RNAV ROUTES IMPLEMENTATION (Cont.)

Benefits

- Reduction of flight distances and times
- Significant fuel and economics savings
- Greater possibilities to obtain optimum FLs
- Path far from mountainous terrains
- Flexible use of airspace
- Uniform application of longitudinal separation
- Extensive use of MNT

EVALUATION of RNAV ROUTES IMPLEMENTATION

Benefits

- Eliminitation of some ATS and ground air communication shortcomings
- Obtain substantial planning and implementation experience
- Significant improvements in regional co-ordination process

RNAV Routes Implementation

Benefits

- According to IATA, total annual saving in RNAV routes implemented:

  More than US $ 9 Million

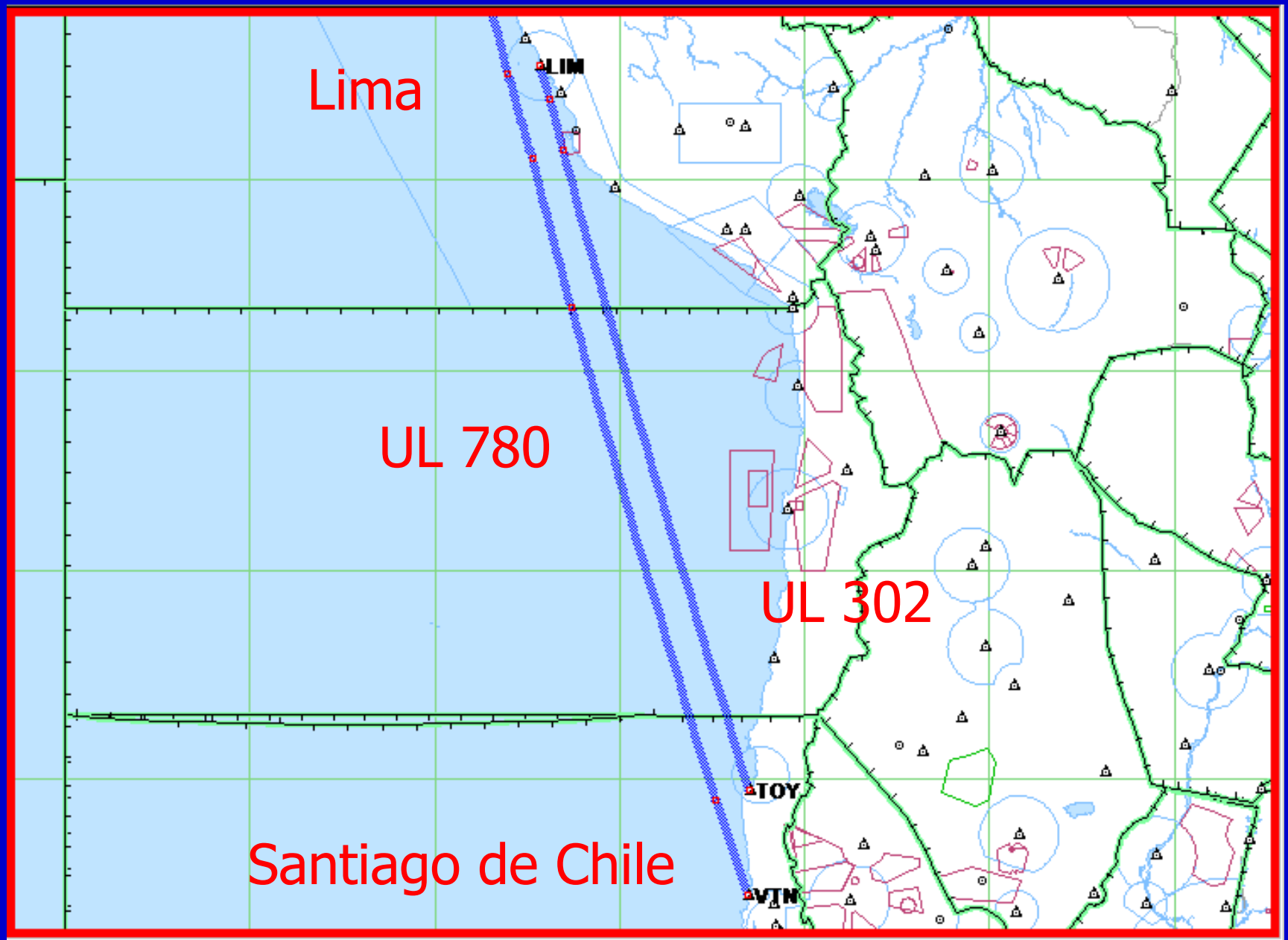
- According to RLA/98/003, annual savings related to fuel savings when the whole RNAV routes associated with the CAR/SAM 18 Traffic Flows were implemented:

  US $ 88 Million

AP/ATM/3 Meeting

- RNP 10 Pre-operational Trials in parallel routes UL 780 and UL 302
- RVSM Implementation Plan in the CAR/SAM Regions

Parallel RNAV RNP 10 routes



RNP and RVSM Implementation

Reduced separation minima using RNP and/or RVSM provides following benefits:

- Increase available optimum FLs for longer time periods
- Increase airspace capacity
- Uniform separation minima
- Standardized ATS procedures
- Increase air operations safety
- fuel and economics savings

RNP Implementation

Milestones

- RNP 10 Pre-operational Trials on segment route Santiago/Lima of UL 780 and UL 302 routes: January 2003

- Study RNAV and RNP Strategy Implementation in the CAR/SAM regions (RNAV/RNP Task Force)

AP/ATM/4
(Santa Cruz, Bolivia, January 2003)

- RNAV Routes
- RNAV/RNP/TF
- RNP 10
- RVSM

AP/ATM/4 (Cont.)

RNAV Routes

- Santiago de Chile-Madrid
- Asunción-Campo Grande
- Sao Paulo-Lima
- Sao Paulo-Santiago de Chile
- Panamá-San Juan de Puerto Rico
- Asunción-Sao Paulo

AP/ATM/4 (Cont.)

- CAR/SAM RNAV Trajectories List
- CAR/SAM RVSM Implementation Guidance
- RNAV/RNP Survey
- RNAV/RNP/TF – RNP Application Strategy
- RNP 10 : Santiago de Chile-Lima - UL 302 and UL 780.

AP/ATM/4 (Cont.)

RVSM/TF

- ATC/WG
- OPS/AIR/WG
- SAM/WG

AP/ATM/4 (Cont.)

- **Review Draft *"Guidance Material for the RVSM Implementation in the CAR/SAM Regions"***
- **RVSM CBA Preliminar Analysis**
- **CONOPS v. 1.2**
- **IG 91-RVSM**
- **Harmonization of RVSM Implementation Date between CARSAM and NAM Regions: 20 January 2005**

RVSM Implementation

Milestones

- GREPECAS approved RVSM implementation in the CAR/SAM Regions
- Harmonization date and vertical stratus for implementation: January 20, 2005 - FL 290 to FL 410
- GREPECAS approved CAR/SAM Regional Airspace Monitoring Agency (CARSAMMA)

RVSM Implementation

- **According to RVSM/TF's CBA study:**
  -Forseen 15 years CAR/SAM RVSM fuel savings:

US $ 312' 095, 523.54

AP/ATM/4 (Cont.)

CARSAMMA

- **WEB SITE**
  www.cgna.gov.br/carsam/español/index.htm
  www.cgna.gov.br/carsam/english/index.htm
- **E-mail**
  carsamma@cgna.gob.br

AP/ATM/4 (Cont.)

Future Meetings

"Meeting/Workshop of Air Traffic Management Authorities and Planners in the CAR/SAM Regions for the RVSM, RNAV routes and RNP Implementation"

AP/ATM/5 (RVSM-RNAV-RNP)
Panama, 18-20, june 2003
AP/ATM/6 (RVSM-RNAV-RNP)
TBD, 27-31, October, 2003

Project RLA/98/003

Coordination Committee

(Lima, Perú, 17 - 18 March 2003)

"Assistance to ICAO's Regular Programme in Regional CARSAM CNS/ATM Implementation and evolutionary improvements"


GRACIAS