

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Meeting/workshop of Air Traffic Management (ATM) Authorities and Planners
(Lima, Peru, 18 to 21 July 2000)

Agenda Item 2: **Requirements, which should be fulfilled for the trials and demonstrations in temporal RNAV routes between Santiago-Lima/Miami and Sao Paulo-Rio de Janeiro/Miami**

AIRSPACE. COORDINATION AND TRAINING MATTERS

(Presented by the Chairman of the IC Subgroup)

SUMMARY

This paper outlines some of the steps as seen from the ATC perspective that will be necessary to carry out the flight trials of the RNAV routes from Miami to Rio/Sao Paulo and Miami to Santiago de Chile. Given the experimental nature of these trials, the items listed here are only a first draft of the possible steps that need to be covered prior to the trials. The intention of this paper is to generate and advance the discussions regarding the steps that will be required to carry out this task.

1 Background.

- 1.1 The second meeting of the CNS/ATM/IC subgroup during its deliberations decided that it would be fruitful to begin taking advantage of the current navigational capabilities available in aircraft operating in the region today. The group was of the opinion that it was no longer necessary to require aircraft to fly indirect routes being that aircraft are no longer forced to fly routes based on ground navigational aids.
- 1.2 Although RNAV routes have been in use for a while, long distance routes such as the ones proposed in these trials have not been used. The routes that we intend to demonstrate are similar to the ATS routes currently based on ground based navigational aids. These conventional routes typically are not the most direct routes between two points and are not the most efficient routes between city pairs.
- 1.3 The use of these routes will not only benefit carriers economically by shortened flight times, but they will serve to provide air crews and controllers

with the experience necessary to control these types of routes in the future as these RNAV routes proliferate.

- 1.4 Coordination of this effort has been assigned to the Chairman of the IC sub-group and the member from IATA. Based on the foregoing the second meeting of the IC sub-group issued the following decision:

DECISION 2/5 RNAV TRIAL/DEMONSTRATION ROUTES

That,

- a) A trial/demonstration program be established containing the different elements of the ATM system for the CAR/SAM Regions in a series of RNAV long range routes as previously listed
- b) The chairman of the CNS/ATM/IC subgroup and the IATA member be assigned the responsibility of preparing an implementation program and coordinate as necessary so that it may be implemented as soon as possible.

- 1.5 In order to support this plan, several meetings have so far been held between the Chairman, the member from IATA and representatives from several of the major air carriers, ICAO and informally with representatives from some States. All of the carriers have expressed their support for more efficient and direct routes between South and North America.

2 Trial/Demonstration Route Selections

- 2.1 After several meetings the task force decided to begin trials with only two of a number of the routes considered. The two routes selected for trials will be between the city pairs of:

- a. Sao Paulo-Rio de Janeiro/Miami
and
- b. Santiago de Chile-Lima/Miami

3 Route Considerations

- 3.1 During the planning process it was agreed that the routes would need to consider the possibility of having to make adjustments for any of the following reasons:
- a. Areas of poor communications
 - b. Special Use Airspace
 - c. Terminal ATM conditions
 - d. Aircraft engine limitations regarding mountainous terrain and letdown criteria
 - e. Emergency procedures
- 3.2 The meeting also stipulated that the following minimum requirements should be met during these trials/demonstrations:
- a. Aircraft shall be equipped with at least RNAV capability
 - b. The lowest flight level assigned should be FL 310
 - c. If possible, the longitudinal separation standard should be 10 minutes in trail using the Mach number technique
 - d. The routes will be assigned a RNP value at a later date

4 **Agreements**

- 4.1 The following agreements are foreseen:
- a. Service provider to service provider
 - b. Service providers to participating carrier
 - c. Service providers to controller representatives
 - d. Service provider to respective military authority
- 4.2 These trials essentially only involve the service providers in each of the FIRs containing the demonstration routes and the carriers participating in the trials.
- 4.3 The group, therefore, in order to keep a tight control of the project may wish to consider the development of a standard written agreement for signature between the parties involved. This single agreement could be developed from

among all participating States with input from ICAO and then signed by each of the parties participating in the trials. A model of memorandum of understanding (MOU) is shown in **Appendix B** to this working paper.

- 4.4 This agreement should contain sufficient technical details to enable these trials to be conducted with a level of safety equivalent to current operations. Issues such as frequencies, crossing points, altitudes, contingency procedures and others should be addressed in the agreements.
- 4.5 In addition, the meeting should consider the implementation of bilateral agreements between service providers that may involve more than one Member State.

5 **Procedures**

- 5.1 The meeting should consider the development of the following procedures:
- a. Definition of coordination points/transfer of control points
 - b. Altitudes and/or flight level assignment
 - c. Coordination methods and requirements.
 - d. Flight plan filing
 - e. Separation minimums to be used
 - f. Carriers will provide a list of flight numbers that will be participating in the trials
 - g. Aircrews will be required to fly the filed flight plan unless affected by severe weather or requested to amend their route by ATC
 - h. ATC shall not amend routes unless required to ensure separation is maintained from other air traffic.
 - i. Identification of demonstration flights within remarks of flight plan
 - j. Aircrew Contingency/Emergency procedures shall comply with established ICAO standards

- k. A survey form will be completed by each facility on a daily basis. The surveys will include a summary of the comments from operational personnel

6 Training

6.1 ATC Facilities

- 6.1.1 Mandatory briefings shall be held at each of the ATC facilities that will be affected by these routes. Controllers should be given an opportunity to comment on the procedures and propose amendments or changes as necessary. The training package should be uniformed and adjusted by each facility as required to conform to their operational needs.
- 6.1.2 A survey form shall be developed and included as part of the training package. This will allow the controllers to comment on the demonstration and provide feedback to the group.

6.2 Carriers

- 6.2.1 It is recommended airline companies also develop training materials similar to the ATC facilities. Aircrews should be briefed on the route concept and the procedures developed as part of the demonstration project. Training materials between airlines should also be similar and include contingency procedures to utilize during weather related events.
- 6.2.2 A survey form should also be developed and included as part of the training package. This will allow the aircrews to provide their comments on the demonstration project and provide feedback to the group and to their companies.

7 **Action suggested**

7.1 The meeting is invited to:

- a) take note of the information provided in this working paper;
- b) review thoroughly paragraphs 3, 4, 5 and 6 with a view to establish the procedures, agreements and necessary training to achieve an efficient tests and demonstrations programme in the referred working paper.
- c) Review Appendix A, with a view to obtain a common AIC, which should be published by all the States involved.
- d) Review **Appendix B** of this working paper, in order to agree in a common memorandum of understanding to be signed by States and Organizations/Air Carriers involved in the trials and demonstrations.

AIC Model for the Implementation of RNAV Trial and Demonstration Routes in the CAR/SAM Regions

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1. INTRODUCTION

1.1 GREPECAS, through the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), and CAR/SAM States, has developed a trial and demonstration programme for the new Santiago/Lima-Miami and Sao Paulo/Rio de Janeiro-Miami RNAV routes. The aim of this exercise is to allow users to use the avionics already installed in their aircraft, and thus obtain substantial flying time and fuel savings between the selected city pairs, through the use by ATS service providers affected by these routes in both regions of the 10-minute longitudinal separation and/or 80 NM RNAV between aircraft flying at the same level, guaranteed by the use of the Mach number technique (MNT).

1.2 The purpose of this AIC is to summarize the operational procedures that will support the Trial and Demonstration programme. For further information and details, please consult the ICAO NACC and SAM Regional Offices, the IATA Latin American Office, or the Civil Aviation Administrations of the States included in these trials.

1.3 A complete version of these RNAV trials and demonstrations may be found at the following Internet address (HYPERLINK "<http://www.xxxx>" www.xxxx)

1.4 The RNAV Trial and Demonstration Route Implementation Programme includes the following appendixes:

APPENDIX 1	To be defined
APPENDIX 2	To be defined
APPENDIX 3	To be defined
ETC.	

2. RNAV Trial and Demonstration Routes

2.1 Details of the RNAV Trial and Demonstration Routes

3. **ATS Procedures**

3.1 Details of ATS procedures applicable to tests and demonstrations of RNAV routes for the CAR/SAM Regions

4. **Airline procedures**

4.1 Details of procedures applicable to airlines / minimum requirements to operate in routes XXX and XXX

5. **Contingency procedures**

5.1 Details of contingency procedures for tests and demonstrations of RNAV routes for the CAR/SAM Regions

6. **Implementation date**

6.1 Implementation details of RNAV trial and demonstration routes

Model

Memorandum of Understanding (MOU) between States participating in trials and demonstrations in routes UT780 and UT795 and IATA on behalf of participating airlines

The States participating in the trials and demonstrations of routes UT780 (Santiago de Chile – Lima/ Miami) and UT795 (Sao Paulo-Rio de Janeiro/ Miami) on one side, and IATA on behalf of the airlines participating in such trials on the other;

Taking into consideration **that GREPECAS, on behalf of the International Civil Aviation Organization, and States of the CAR/SAM Regions have developed a Trials and Demonstrations Programme on the new provisional RNAV routes Santiago-Lima / Miami (UT780) and Sao Paulo-Rio de Janeiro / Miami (UT795);**

Considering that air operations along these routes will allow users to make use of avionics already installed on board of their aircraft, thus enabling substantial reductions in flight time and fuel consumption between the selected city pairs;

Acknowledging that trials and demonstrations along these routes will be fulfilled with a safety level in accordance with that applied to regular air operations;

Hereby agree:

Article I

1. Agreement's coverage

- 1.1 This MOU is aimed toward establishing operational specifications such as rules, procedures and minimum requisites to operate on routes UT780 and UT795, with a view to assuring that the trials and demonstrations to be performed on these routes are clearly defined to participating Air Traffic Services and Airlines.

Article II

2. Terms of agreement

- 2.1 Trials and demonstrations will be held during a period of 91 days, starting on October 5, 2000. If agreed by the parties involved, and in coordination with all other parties, the finalization date could be postponed.

Article III

3. ATS procedures

- 3.1 Air Traffic Services, further to abide by regular procedures, should comply with:
- a) lowest cleared en-route flight level will be FL310;
 - b) at reporting points where transference of responsibility is performed (FIR boundaries), a minimum longitudinal separation of 10 minutes/80 NM RNAV between aircraft at the same level will be in force, these being assured by utilization of Mach Number Techniques (MNT), unless a minor separation has been accorded in an Operational Letter of Agreement.

Note 1: Information required to fulfill the above-mentioned separations is found in Doc.4444 – Rules of the Air and Air Traffic Services – Part III – Sections 8.4 and 8.5.

Note 2: Means to apply Mach Number Techniques (MNT) may be found in Doc.9426 – Air Traffic Services Planning Manual – Part II – Section 2 – Chapter 2.

- 3.2 The Operational Letters of Agreement signed by Air Traffic Services involved establish the points for transference of responsibility.

Article IV

4. Procedures to be followed by (airline) and minimum requisites to operate in route UT.....

- 4.1 Airlines participating in this exercise should comply with the following requisites:
- a) All aircraft flying this route shall be equipped with RNAV equipment:

Note: The equipment that aircraft must have available to comply with RNAV navigation requirements is shown on Doc. 9613 – Manual on Required Navigation Performance (RNP) – Chapter 6 and Appendix C.

- b) Compliance with actual dispositions and relevant dispositions shown in Doc. 7030 – Regional Supplementary Procedures – CAR and SAM Parts – for flight planning, Mach number, air-ground communications and reporting, in-flight contingency procedures and air traffic clearances, will be mandatory.

Article V

5. General dispositions

- 5.1 This MOU will come into force since October 5,2000 and will be valid for 91 days.
- 5.2 This MOU may be amended through reversal letters, by mutual agreement of the parties and, after previous coordination with States and Dependencies involved in these trials and demonstrations.
- 5.3 This MOU could be declared invalid by unilateral decision of any of the parties, though a 30-day previous notification to all parties involved is required.
