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WP/14
20/01/03

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

Fourth Meeting/Workshop of Air Traffic Management (ATM) Authorities and Planners (AP/ATM/4)

Santa Cruz, Bolivia, 27-31 January 2003

Agenda Item 3: Review of the matters related to RVSM Implementation in the CAR/SAM Regions

b) ATC Operations Working Group

Concept of Operations

(Presented by the United States)

Summary

This paper discusses ongoing issues and tasks of the ATC Operations Working Group necessary for RVSM implementation in the Caribbean/South American regions. Specifically, this paper presents the latest draft version of the CAR/SAM RVSM Concept of Operations for review and comment by the States.

1. Introduction

1.1 The ATC Working Group (ATC/WG) is responsible for addressing air traffic issues related to RVSM implementation in the Caribbean and South American regions. In addition to the specific terms of references assigned by the full RVSM Task Force, the ATC W/G is also charged with working with each CAR/SAM State to assist them in RVSM implementation. In order to meet these tasks, the ATC W/G has developed a Concept of Operations that can be used as a guide for RVSM implementation by ATC service providers.

2. Narrative

2.1 Attached is the latest version of the Concept of Operations (CONOPS), Version 1.x. This Version completes those sections that were not completed by the last T/F meeting in Rio de Janeiro. It also includes the conclusions and decisions of the GREPECAS meeting of December 2002 in Brazil.

2.2 The CONOPS is also being used to facilitate the development of a regional RVSM training manual for ATC service providers. The first draft of this manual will be presented as a separate paper during this meeting.

2.3 It is important to note that the CONOPS is a template that describes, in general terms, how RVSM operations will be conducted in the CAR/SAM region. Each State will still be responsible for determining how specific RVSM operations will be conducted within airspace under their control.

3. Conclusion

3.1 The meeting is invited to take note of the above information.

3.2 The meeting is requested to adopt the following conclusion:

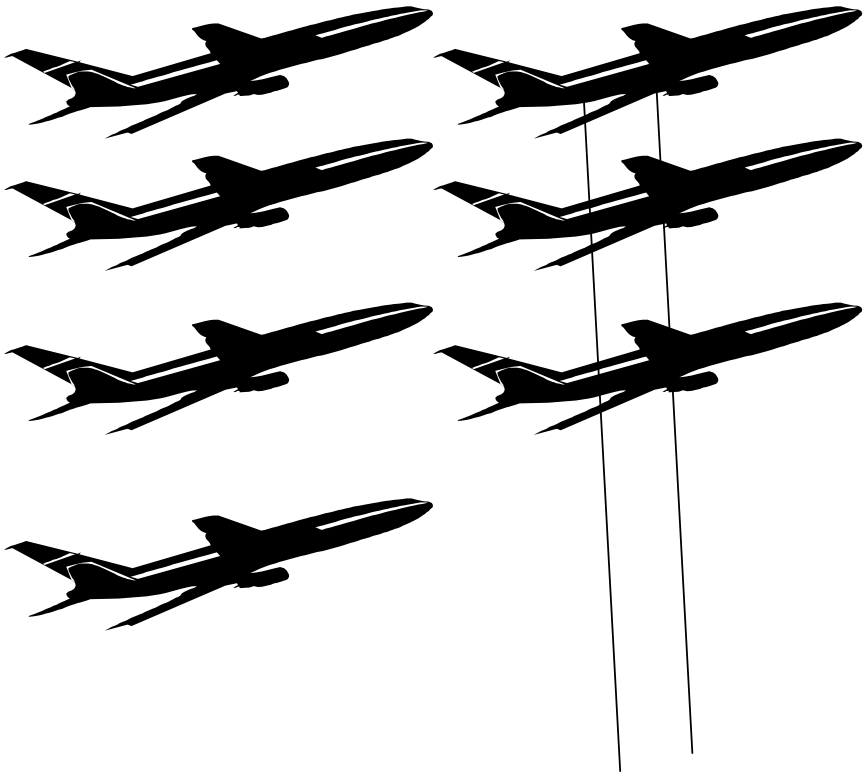
> "That the RVSM Task Force accept Version 1.x of the CAR/SAM Concept of Operations as a working document to be used as a guide by ATC service providers for the implementation of RVSM in the CAR/SAM region, with the understanding that the CONOPS may be amended over time to meet the needs of the States of the region."

APPENDIX

CARIBBEAN/SOUTH AMERICA
(CAR/SAM)

REDUCED VERTICAL SEPARATION MINIMUM
(RVSM)

CONCEPT OF OPERATIONS



Prepared by the Caribbean/South American (CAR/SAM) RVSM Implementation Task Force

January, 2003

FOREWORD

The *Caribbean/South American RVSM Concept of Operations* is published by the ATM/CNS Subgroup of the Caribbean/South American Regional Planning and Implementation Group (GREPECAS). It describes anticipated future RVSM operations within the CAR/SAM region*.

**Note: For the purposes of this document, the Caribbean and South American regions will be referred to as one region, i.e.; CAR/SAM region.*

The GREPECAS and its contributory bodies will issue revised editions of the Document as required to reflect ongoing implementation activities.

Copies of the *CAR/SAM Concept of Operations* can be obtained by contacting:

ICAO NORTH AMERICAN, CARIBBEAN, AND CENTRAL AMERICAN OFFICE		
MEXICO CITY, MEXICO		
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AMENDMENT HISTORY		
Version No.	**Date**	**Originator**
V 1.0	September 2002	First version developed by ATC Working Group of the RVSM Task Force
V 1.1	January 2003	Revision containing GREPECAS Dec. 2002 Conclusions

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1. PART I – SCOPE

1.1 SCOPE OF THE CAR/SAM REGION RVSM CONCEPT OF OPERATIONS

1.1.1 The intent of this concept of operations is to define the use of Reduced Vertical Separation Minimum separation standards within the Caribbean and South American Regions. RVSM has been successfully implemented within a vast portion of the world's airspace over the last 5 years. The States, ATC service providers, and airspace users of the CAR/SAM regions have recognized the benefits of RVSM operations and have authorized, through GREPECAS, the use of RVSM separation standards beginning in 2004.

1.1.2 This document will begin with a short history of RVSM implementation efforts in the region. This will be followed by an explanation of the basic operating principles of the region and a description of normal operations within the current system. Section Three identifies the airspace within which RVSM operations will be conducted. Section Four deals with the envisioned use of RVSM, including those aspects covered by ICAO directives and those aspects that will be unique to the CAR/SAM region. Section Five outlines the necessary ATC personnel issues associated with RVSM implementation. Sections Six and Seven deal with the anticipated airspace and document changes. Section Eight contains procedures for switching from the current system to RVSM operations.

1.1.3 As cost-benefit analyses are still in progress for RVSM operations in the region, this document will concentration on the operational aspect of RVSM. Once the cost benefit analyses are completed, any impact on this document will be incorporated at a later date.

1.2 BASIC PRINCIPLES USED IN THE DEVELOPMENT OF THIS DOCUMENT

Introduction

1.2.1 RVSM has been an active subject at CAR/SAM regional meetings since its initial implementation in the North Atlantic in 1997. Recognizing the benefits of RVSM operations, the Third CAR/SAM Regional Air Navigation Meeting (Buenos Aires, Argentina, 1999) approved the use of RVSM separation standards in the Caribbean region. GREPECAS 12, held in October 2001, directed that CAR/SAM States and ATC service providers implement RVSM in two phases beginning in April 2004. RVSM operations began in the European/South American Corridor in 2001. Initial plans called for RVSM implementation in the domestic United States, Mexico, and Canada in December 2004. However, it now appears that this date will change slightly to accommodate chart dates and other AIC issues. Regardless of the actual date, this document envisions a simultaneous implementation between the CAR/SAM region, the domestic United States, Mexico, and Canada. In fact this operational concept assumes that all aspects of RVSM implementation; altitudes, exclusionary and transition airspace, operational procedures, etc., will be harmonized throughout the region(s). This concept has been accepted by the full RVSM Task Force and was submitted to the States for approval at the December 2002 meeting of GREPECAS.

2. OVERVIEW OF THE CURRENT CAR/SAM SYSTEM

2.1

2.1.1 The CAR/SAM airspace is divided into the following Flight Information Regions (FIRs).

- Mazatlan Oceanic
- Mazatlan
- Monterrey
- Houston
- Miami Oceanic
- Port au Prince
- Santo Domingo
- Habana
- San Juan
- Piarco
- Mexico
- Merida
- Kingston
- Curacao
- Central American
- Panama
- Barranquilla
- Maiquetia
- Georgetown
- Paramaribo
- Rochambeau
- Bogota
- Guayaquil
- Lima
- Porto Velho Manaus
- Belem
- Recife
- Brasilia
- La Paz
- Asuncion
- Montevideo
- Resistencia
- Curitiba
- Antofagasta
- Cordoba

Almost every FIR offers some level of ATC services, with most States/ATC service providers offering positive control under IFR flight rules, flight following, search and rescue, flight information services, and inter-facility/intra-facility communications and coordination.

2.1.2

Airborne Collision Avoidance Systems (ACAS/TCAS)

2.1.3 Almost 100% of the long haul international commercial aircraft fleet is equipped with ACAS, with most operators having installed, or planning to install, the latest upgrades (TCAS v.7/ACAS III) that accommodate RVSM operations and eliminate "nuisance alerts". In addition, a substantial portion of the business aviation turbojet fleet has equipped with ACAS.

Traffic flows and traffic demand

2.1.4 Traffic within the region is comprised of several identifiable flows, both on an international and domestic level. International traffic within the CAR/SAM region runs primarily on a North/South basis, mainly between the major airports and population centers. In the major market runs between North America and South America most of the flights are in excess of 3 hours in length, and are flown by new generation aircraft.

2.1.5 Within the CAR region, most high altitude flights that exceed four hours in length originate or end in Miami. There is also a substantial flow of traffic between the CAR/SAM and Europe. The aircraft are already RVSM approved since they must transit RVSM exclusionary airspace in the North Atlantic.

2.1.6 Within the SAM region, high altitude international flights mirror the environment of both North America and Europe. The route system is complex and dynamic and features numerous crossing points that increase the complexity of operations.

2.1.7 With the exception of Brazil, very few States have domestic operations that exceed 3 hours in length. However, many States have substantial amounts of domestic traffic that utilizes the altitude stratums envisioned for RVSM operations. These operations occur with some frequency. In addition, there is a substantial amount of "short haul" international traffic between States. Although these flights are less than 3 hours long, the vast majority of them use the high altitude route structure.

2.1.8 Approximately 80% of the long haul international fleet is already approved for RVSM operations. Approximately 60% of the short haul international and domestic fleet is currently approved. Unconfirmed estimates are that 95% of the long haul fleet can be expeditiously approved for RVSM operations by the 2004/2005 timeframe, with approximately 85% of the short haul fleet meeting the same criteria. Estimates for the general aviation and business fleets are currently being developed.

2.1.9 If the above estimates prove correct, approximately 15% of the air carrier fleet will normally operate below RVSM exclusionary altitudes. This figure is similar to the percentage of aircraft operating below FL290 in today's environment. These figures do not take into account state/military aircraft, or the cargo fleet. Cargo fleet numbers are expected to be slightly lower than those of the air carrier fleet.

2.1.10 It should be noted that there are only a few areas of the CAR/SAM region that experience sustained, ongoing periods where operational demand exceeds capacity. This is because 80% of long haul international traffic operates in the "hub-spoke" concept. This means that aircraft operations tend to come in waves of traffic, with several airlines operating flights between city-pairs in close time proximity to each other. However, this causes what could be termed "rolling demand pockets", where demand exceeds capacity in small, focused patches of airspace that move around the ATC system. These pockets of congestion are greatly impacted by weather systems and system equipment outages, and they tend to cause to present the greatest operational challenge at places in the system where routes and traffic flows intersect or merge. It is in this type of scenario that RVSM offers the greatest operational benefit for the region.

2.2 GROUND SYSTEMS

2.2.1 General

The majority of ground based ATC systems are currently aligned to provide service along the major traffic flows of the region.

2.2.2 Air/ground Communications

Currently, some 70% of the airspace within the CAR/SAM region is covered by direct pilot/controller communications. This figure excludes oceanic airspace located on the eastern and western edges of the region.

This operational concept assumes that over 80% of the airspace within which RVSM operations will be conducted will have direct pilot/controller communications capability in the 20004/2005 timeframe. It also assumes that over 95% of the major traffic flow routes within this airspace will be covered by direct pilot/controller communications capability. These numbers apply to FL290 and above.

2.2.3 Ground/Ground Communication

Currently inter-facility communications capability in the region approaches 100%. Although there are ongoing problems with reliability and compatibility between systems, these problems are being addressed through regional work groups. A comprehensive and realistic plan is in place to address these issues over the next 2-3 years.

This operational concept assumes that 100% of the facilities providing ATC services to aircraft operating in RVSM airspace will have the capability to exchange flight data and critical flight information with those ATC service providers adjacent to them. This may be accomplished via several methods, including voice communication and electronic data exchange.

2.2.4 Navigation

Currently, a system of ground based navigational aids, supported by a growing system of advanced navigational routes (RNAV/RNP/GNSS) serves the major traffic flows in the region.

Because RVSM increases capacity along a given route, regardless of the technology that supports it, RVSM will enhance operations under any situation. This operational concept assumes that the number and scope of advanced navigational routes in the region will continue to grow. This route system will be complimented by the introduction of RVSM operations. As the level of navigational accuracy increases with the use of advanced technology, the risk of collision actually increases. This is due to the fact that aircraft will fly the centreline of existing routes with more precision, placing them in closer proximity with each other during any type of vertical maneuver. Procedures for the use of lateral offsets will be included in RVSM implementation to reduce the impact of this issue on the safety analysis.

2.2.5 Surveillance

In today's environment, approximately 55% of airspace in the CAR/SAM region is covered by radar surveillance. This excludes the oceanic airspace located on the eastern and western edges of the CAR/SAM regions.

This operational concept assumes that approximately 65% of CAR/SAM airspace will be covered by radar surveillance in the 2004/2005 timeframe. This is mainly due to the addition of several new radar installations within Brazil. Additionally, this operational concept assumes that approximately 85% of the routes along which RVSM operations will be conducted will have radar coverage. The region will also see the introduction of other surveillance methods, including Automatic Dependant Surveillance (ADS-A/B) in the mid-term timeframe.

In summary, this document assumes that controllers will have both radar coverage and voice communications with approximately 80% of aircraft operating in RVSM airspace along the major route systems in the region when RVSM operations begin.

2.2.6 Separation standards

Vertical

Current standards used in the region are 2000 feet above FL290 and 1000 feet at FL290 and below.

Lateral

Current standards used in the region are radar, 50 miles lateral, and 90 miles lateral.

Longitudinal

Current standards used in the region are radar, 10 minutes, 15 minutes, and 20 minutes. There are also a number of procedural rules in use that allow less separation during climbing and descending.

2.3 AIR TRAFFIC MANAGEMENT

Planning Requirements

2.3.1 The impact of RVSM implementation on the regional traffic flow management system must be mitigated to insure that the system is enhanced by the new capability. This will be accomplished by harmonizing regional planning efforts, insuring that procedures are in place to handle unusual or significant events such as weather and equipment outages, harmonizing altitudes and airspace issues, and taking steps to insure the additional capacity realized from RVSM does not negatively impact controller workload. Coordination between ATC service providers must be standardized to:

a) maintain or improve safety at increasing levels of traffic density;
b) increase tactical control, both in the resolution of conflicts and the issuance of a timely and flexible ATC response unusual system impacts, such as weather deviations;
c) take full advantage of reduced separation minima;

d) improve the co-ordination between adjacent centres by maximum use of automated facilities; improve the co-ordination/transition issues between Oceanic and Domestic ATS units.

A regional manual is being developed that will contain detailed procedures to handle all situations where RVSM will have a unique impact on traffic management issues, including the termination of RVSM operations due to weather or turbulence.

Several States within the CAR/SAM region have expressed interest in the implementation of a regional traffic flow management facility. Such a facility would be extremely beneficial, not only in the implementation of RVSM, in the overall management air traffic. A regional air traffic management facility would provide the following services in support of RVSM operations in the region:

- Providing suggested traffic management restrictions to insure that RVSM operations do not result in any one sector/FIR becoming saturated with air traffic.
- Providing an "early warning" capability based on projected flight schedules
- Providing suggested routings and any associated traffic restrictions needed to deal with severe weather events, turbulence, special traffic events, equipment failures, staffing issues, military training areas, etc.
- Offering daily or hourly updates to regional ATC service providers to assist them with planning traffic management strategies.
- Serving as a backup communications network for the region.
- Coordinating the suspension/resumption of RVSM operations within a sector/FIR/region due to turbulence or mountain wave activity.
- Coordination of departure times of flights to insure destination airport arrival rates are not exceeded.

3. IDENTIFICATION OF RVSM AIRSPACE

3.1 RVSM Airspace

3.1.1 This operational concept assumes that all airspace within the CAR/SAM region from FL290 to FL410 will be identified as RVSM airspace, where RVSM operations may be conducted under either exclusionary or transitional procedures. The required safety analysis and documentation shall be completed for all airspace that falls within this description, with the exception of that airspace in the EUR/SAM corridor where RVSM operations are already conducted. It is acknowledged that individual States may chose to limit the scope of RVSM operations within their sovereign airspace. However, by conducting the safety analysis and document changes needed to conduct RVSM operations for all airspace in the region, these States can easily expand RVSM into this airspace at a later date of their choosing, depending on their individual needs. This scenario was endorsed at the December 2002 meeting of GREPECAS. All required safety analysis and procedural development will be accomplished prior to implementation. Additionally, it is expected that a limited amount of transition airspace may have to be established in those FIRs where CAR/SAM airspace adjoins the airspace of other regions were RVSM operations are not conducted.

Non-RVSM approved aircraft will not be allowed to operate in RVSM airspace, with the following exceptions:

- States may develop procedures to accommodate non-approved aircraft in RVSM airspace as long at the flight will be contained within their domestic airspace. When operationally feasible, preference for altitudes in RVSM airspace will be given to approved aircraft

- Non-approved State, humanitarian, maintenance, and military flights may be accommodated within RVSM airspace in accordance with regionally approved procedures

3.2 Transition Airspace

3.2.1 This operational concept assumes that the following airspace will be transition in nature:

- That airspace adjacent to RVSM airspace where transition to/from RVSM is necessary to allow aircraft to enter non-RVSM airspace.

Aircraft will not be required to have RVSM approval to flight plan in, or operate within, RVSM transition airspace.

4. RVSM OPERATIONAL PROCEDURES

4.1 Approved Aircraft

Approved aircraft will be allowed to flight plan into, and operate within, RVSM exclusionary airspace. Controllers may assign any of the following altitudes to these aircraft, depending on operational needs and user requests:

- FL290
- FL300

- FL310
- FL320
- FL330
- FL340
- FL350
- FL360
- FL370
- FL380
- FL390
- FL400
- FL410

Controllers will separate RVSM approved aircraft by 1000 feet from other approved aircraft. All current procedures in use by ATC service providers that stipulate the use of 2000 feet vertical separation will be amend to reflect 1000 feet when applied to approved aircraft.

4.2 Non-Approved Aircraft

Non-approved aircraft operating at FL290 and above will be separated by 2000 feet from all other aircraft, including RVSM approved aircraft. 2000 feet vertical separation must be used regardless of the type of airspace within which the aircraft is operating. Non-approved aircraft will not be allowed to flight plan into, or operate within, RVSM exclusionary airspace. The exception to this rule will be those aircraft specifically identified in regional procedures, such as military/state/humanitarian flights, or aircraft operating entirely within a single state's domestic airspace under procedures developed and coordinated by that state.

4.3 Identification of RVSM Aircraft

This concept of operations assumes that every state will have a method in place to identify RVSM approved aircraft to each ATC service provider. This identification will be in the form of an identifier located within the filed flight plan of the aircraft and must be available in some form at each control position that provides service to the aircraft. Aircraft operators must insure that any aircraft that is RVSM approved uses the appropriate identifier for each flight. Those ATC service providers that do not utilize automated data processing or automated data transfer must insure that proper coordination of an aircraft's RVSM status is coordinated with other service providers in the same manner other critical flight data is coordinated. Controllers must verify the approval status of that aircraft that operates in RVSM airspace. States utilizing automated flight plan processing will insure that any automation is capable of forwarding regionally accepted RVSM designation.

4.4 State/Military Flights

Non-RVSM approved state and military flights will be accommodated in RVSM airspace with prior coordination. Prior coordination will consist of the filing of a flight plan. The issuance of a valid ATC clearance shall constitute approval for the aircraft to operate in RVSM aircraft. Continued flight by these aircraft in RVSM airspace shall be subject to normal operational considerations.

4.5 Weather/Turbulence Procedures/ Suspension of RVSM Operations

RVSM operations can be particularly impacted by the presence of turbulence. This includes turbulence caused by either severe weather activity or the phenomenon known as mountain wave turbulence.

4.5.1 Numerous FIRS within the CAR/SAM region are impacted by turbulence caused by terrain or thermal effect on air movement, also know as mountain wave. The RVSM implementation NOTAM/AIC contains the following language:

The pilot must notify ATC whenever the aircraft:

- **is no longer RVSM compliant due to equipment failure; or**
- **experiences loss of redundancy of altimetry systems;**
- **or encounters turbulence that affects the capability to maintain flight level.**

4.5.2 Turbulence/mountain wave activity can also be forecast with high levels of accuracy. During periods of forecast mountain wave activity, controllers should ask for pilot reports on a regular basis in order to quickly identify any potential problem.

4.5.3 When an ATC service provider becomes aware that turbulence/mountain wave conditions will interfere with an aircraft's ability to maintain the assigned altitude, the first step is to insure that standard vertical separation is established for any aircraft that are, or will be affected by this turbulence. After 2000 feet vertical separation has been established, the next step is to define the area within which the activity is occurring. The ATC service provider should then take the required action to suspend RVSM operations within the defined area. In addition to taking action to restore 2000 feet of vertical separation between aircraft operating with 1000 feet of separation, the service provider must immediately coordinate with surrounding service providers to advise them of the suspension of RVSM operations. This coordination should include at a minimum:

- The reason for RVSM suspension
- The airspace and routes affected
- The time that RVSM operations are/will be suspended
- The expected time RVSM operations will resume, if known
- Any traffic flow management restrictions
- Revised flight data for any aircraft that will enter the adjacent airspace from the airspace where RVSM operations were suspended

4.5.4 The suspension of RVSM does not necessarily mean that controllers cannot still utilize any available altitude within RSVM airspace. Suspension of RVSM for any other operational reason should be handled as above, except that the coordination should include the reason for the suspension. ATC service providers must insure that adequate notice is given to all affected facilities in order to insure an orderly transition to conventional separation standards. In those cases where numerous aircraft are affected by turbulence/mountain wave activity within a relatively small area, controllers may consider the use of other means of separation, such as lateral or longitudinal separation.

4.6 Lateral Offsets

4.6.1 Due to the increasing accuracy of navigational equipment found on today's aircraft, aircraft are able to fly along the current route structure with little or no deviation from route centreline. Although this high level of accuracy is desirable from an operational standpoint, it also increases the risk to aircraft that are climbing or descending through the altitude of another similarly equipped aircraft, since this increased navigational accuracy means that the aircraft are more likely to occupy the same lateral airspace at any given point in time. This risk also occurs during altitude deviations caused by turbulence/mountain wave activity. One method of mitigating this risk is to allow for the use of lateral offsets. The lateral offset procedure is described in Appendix xx in the proposed 7030 amendment.

4.7 Data Collection

4.7.1 ATC service providers should establish a system for gathering and relaying significant information concerning RVSM operations to the appropriate authorities. This information includes suspected non-approved aircraft operating in RVSM airspace without proper authorization, large height deviations, unexpected increases or decreases in the amount of RVSM operations, etc. This data should be collected and forwarded to the CAR/SAM Regional Monitoring Agency (CARSAMMA) using forms prepared by the CAR/SAM RVSM Task Force. In addition, ATC service providers RVSM utilization data should be tracked for use by both State and regional traffic flow management officials.

5. ATC PERSONNEL ISSUES

- **Training**

  Controller training for RVSM will be accomplished using both material prepared by both the RVSM Task Force and the State's own civil aviation authorities. Use of RVSM in the operational environment will be very similar to the use of vertical separation standards currently in use. Special emphasis should be given to those areas where RVSM procedures differ from current procedures, such as suspension of RVSM operations, RVSM contingency procedures, and traffic flow management issues. Training material for controllers will be prepared by the RVSM Task Force and made available to each state. States may use the initial RVSM NOTAM/AIC as an early briefing guide. States should plan for sufficient time to provide individual controller training approximately 15-20 days prior to RVSM implementation. Each State should consider it's own operational situation when initiating training programs, and should customize training materials to match the technology they currently use to deliver air traffic services, such as radar or procedural control. It is highly recommended that States utilize the RVSM Regional Training manual to assist them. States should make use of practice RVSM scenarios and training problems to allow controllers the opportunity to practice the use of RVSM separation prior to actual implementation.

- **Automation**

  Those States utilizing automated flightplan processing will insure that their automated systems can accept, recognize, process, and forward RVSM related flight plan data. This data must be presented to the controller in an easily recognizable format, and in such a

way as to enhance the controller's ability to conduct safe, orderly, and efficient operations within their assigned airspace.

6. AIRSPACE CHANGES

6.1 After analysis of the airspace, it has been determined that RVSM implementation in and of itself will not require the alteration of airspace within the CAR/SAM region. However, the use of RVSM will expedite the development of new route systems in the region by allowing the elimination of some routes, due to the increased capacity offered by RVSM.

7. DOCUMENT CHANGES

7.1 Changes will made to all necessary regional documentation, including the CAR and SAM Doc 7030s.

8. SWITCHOVER PROCEDURES

8.1 Switchover procedures will be as follows:

Content to be developed by ATC working group

LIST OF ACRONYMS

ACAS	Airborne Collision Avoidance System
ADS	Automatic Dependent Surveillance
AFS	Aeronautical Fixed Services
AFTN	Aeronautical Fixed Telecommunications Network
AIDC	Air Traffic Services (ATS) Inter-facility Data Communications
AMSS	Aeronautical Mobile-Satellite Service
ASM	Airspace Management
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Services
CIDIN	Common ICAO Data Interchange Network
CNS/ATM	Communications, Navigation and Surveillance/Air Traffic Management
CPDLC	Controller Pilot Data Link Communications
CTA	Control Area
ETOPS	Extended Range Operations of Twin-Engined Aeroplanes
FANS-1/A	Future Air Navigation Systems Avionics
FIR	Flight Information Region
FLAS	Flight Level Allocation Scheme
FMS	Flight Management System
GNE	Gross Navigation Error
GNSS	Global Navigation Satellite System
HF	High Frequency
ICD	Interface Control Document
IGA	International General Aviation
IRU/INS	Inertial Reference Unit/Inertial Navigation System
LIM NAT RAN	Limited (COM/MET/RAC) North Atlantic Regional Air Navigation (1992) Meeting
MNPS	Minimum Navigation Performance Specifications
NAT	North Atlantic
NAT IMG	North Atlantic Implementation Management Group
NAT SPG	North Atlantic Systems Planning Group
NAT TFG	North Atlantic Traffic Forecasting Group
NDB	Non Directional Beacon
NICE	NAT Implementation Management Group Cost Effectiveness
OAC	Oceanic Area Control Centre
OCA	Oceanic Control Area
OLDI	On Line Data Interchange
OTS	Organized Track System
PIP	Product Improvement Package
RNP	Required Navigation Performance
RVSM	Reduced Vertical Separation Minimum
SARPS	Standards and Recommended Practices (ICAO)
SATCOM	Satellite Communications
SSR	Secondary Surveillance Radar
TLS	Target Level of Safety
UTC	Universal Co-ordinated Time
VHF	Very High Frequency
VDL	VHF Data Link
VOR/DME	Very High Frequency Omnidirectional Range/Distance Measuring Equipment
WPR	Waypoint Position Report

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PROPOSAL FOR AMENDMENT OF THE ICAO REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030)

a) Regional Supplementary Procedures:

Doc 7030 – CAR/SAM Regions, Rules of the Air, Air Traffic Services and Search and Rescue

b) Proposed by:

CAR/SAM RVSM Task Force

c) Proposed amendment:

Insert in Paragraph XXXXX

7.5 Special procedures for lateral offsets within CAR/SAM airspace

Note: The following incorporates lateral offset procedures for both the mitigation of the increasing lateral overlap probability and wake turbulence encounters.

7.5.1 It has been determined that allowing aircraft conducting flight in non-radar conditions to fly lateral offsets not to exceed 2 NM right of centerline will provide additional safety margin and mitigate the risk of conflict when non-normal events such as aircraft navigation errors, height deviation errors and turbulence induced altitude-keeping errors occur.

7.5.2 This procedure provides for offsets within the following guidelines. Along a route or track there will be three positions that an aircraft may fly: centerline or one or two miles right. Offsets will not exceed 2 NM right of centerline. The intent of this procedure is to reduce risk (add safety margin) by distributing aircraft laterally across the three available positions.

a) Aircraft without automatic offset programming capability must fly the centerline.

b) Operators capable of programming automatic offsets may fly the centerline or offset one or two nautical miles right of centerline to obtain lateral spacing from nearby aircraft. (Offsets will not exceed 2 NM right of centerline). An aircraft overtaking another aircraft should offset within the confines of this procedure, if capable, so as to create the least amount of wake turbulence for the aircraft being overtaken.

c) Pilots should use whatever means is available to determine the best flight path to fly.

d) Pilots should also fly one of the three positions shown above to avoid wake turbulence. Aircraft should not offset to the left of centerline nor offset more than 2 NM right of centerline. Pilots may contact other aircraft on frequency 123.45, as necessary; to coordinate the best wake turbulence offset option.

Note: It is recognized that the pilot will use his/her judgement to determine the action most appropriate to any given situation and has the final authority and responsibility for the safe operations of the aeroplane

e) Pilots may apply an offset outbound at an oceanic entry point and must return to centerline at the oceanic exit point.

f) Aircraft transiting oceanic radar areas may remain on their established offset positions.

g) There is no ATC clearance required for this procedure and it is not necessary that ATC be advised.

d) Proposer's reason for amendment: To facilitate the implementation of RVSM in the CAR/SAM regions.

e) Proposed implementation date of the amendment:

As soon as practicable after approval by Council.

f) Proposal circulated to the following States and international organizations:

g) Secretariat comments:

Utilizing lateral offsets will offer another method of dealing with